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INSTALLATION RESTORATION PROGRAM RECORDS SEARCH

For Alaska DEW Line Stations





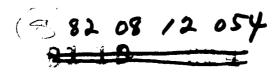
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Prepared for

AIR FORCE ENGINEERING AND SERVICES CENTER DIRECTORATE OF ENVIRONMENTAL PLANNING TYNDALL AIR FORCE BASE, FLORIDA 32403

JUNE 1982





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Installation Restoration Program (IRP) Records Search, AK DEWline

3 0 JUL 1982

REPLY TO ATTN OF:

SUBJECT:

TO

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- 1. We provided your office with copies of the subject report on or about 10 Dec 81. This study used a site rating model developed in Jun 1981 to identify the potential for contamination resulting from past disposal practices. On 26-27 Jan 82, representatives of USAF OEHL, AFESC, several major commands, Engineering Science, and CH2M Hill met at our office to develop an improved rating system. The new rating model, Hazardous Assesment Rating Methodology (HARM), is now used for all Air Force IRP studies. To maintain consistency, AFESC had their on-call contractors review their phase I studies performed before the advent of HARM and provide two additional appendices. The new appendices address the background of the HARM system and evaluate each of the phase I sites using the Jan 82 rating methodology.
- 2. Enclosed are copies of the added appendices for the Installation Restoration Program (IRP) Records Search at AK DEWline. Request you attach these appendices to the phase I reports we provided you in Dec 81.
- 3. For AFRCE-WR: Request you distribute copies of the new appendices to the Regional Environmental Protection Agency and Alaska Department of Environmental Conservation.
- 4. For DTIC. Request you integrate the enclosed appendices with the Installation Restoration Program Records Search for AK DEWline into the National Technical Information System (NTIS). The report and new appendices are approved for public release with unlimited distribution.
- 5. Our project officer for IRP is Mr. Burnet, A/V 432-4430.

FOR THE COMMANDER

Lesige C. Windrew
GEORGE C. WINDROW

Actg bir of Eng & Env Plng

l Atch Appendices

82 08 12 054

Readiness is our Profession



INSTALLATION RESTORATION PROGRAM RECORDS SEARCH

For Alaska DEW Line Stations





Prepared for

AIR FORCE ENGINEERING AND SERVICES CENTER DIRECTORATE OF ENVIRONMENTAL PLANNING TYNDALL AIR FORCE BASE, FLORIDA 32403

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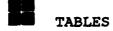
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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS USED IN THE TEXT

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS USED IN THE TEXT

ADCOM Air Defense Command **AFESC** Air Force Engineering and Services Center **AFS** Air Force Station CE Civil Engineering DCS **DEW Communication System** DEW Distant Early Warning Department of Defense DOD **DPDO** Defense Property Disposal Office DSO DEW System Office EOD Explosive ordnance disposal **EPA** Environmental Protection Agency **EWS** Early Warning System ٥F Degrees Farenheit ft Foot (feet) Felec Services, Inc. FSI qpd/ft2 Gallons per day per square foot Gallons per minute qpmMaximum Max. MEK Methyl ethyl ketone Min. Minimum Mean sea level msl Number No. North America Air Defense Command NORAD N.W. Northwest Occupational and Environmental Health Laboratory OEHL Polychlorinated biphenyls **PCBs** POL Petroleum, oil, and lubricants Resource Conservation and Recovery Act **RCRA** SAC Strategic Air Command SACLOG Strategic Air Command Logistics SOI Space Object Identification S.W. Southwest Tactical Air Command TAC USAF United States Air Force United States Geological Survey **USGS**

EXECUTIVE SUMMARY

A. Introduction

- 1. CH2M HILL was retained by the Air Force Engineering and Services Center (AFESC) on May 15, 1981 to conduct the Alaska DEW Line Records Search under Contract No. F0863780 G0010 0004.
- 2. The identification of hazardous waste disposal sites at military installations was directed by Defense Environmental Quality Program Policy Memorandum 80-6 dated 24 June 1980 and implemented by Air Force message dated 2 December 1980 as a positive action to determine the potential for migration of hazardous or toxic wastes from DOD installations, to prevent migration, and implement clean-up actions as necessary. The Records Search comprises Phase I of the Department of Defense Installation Restoration Program. The main purpose of the Records Search Program is to determine the potential, if any, for migration of toxic and hazardous materials off the installation as a result of past operations and disposal activities.
- 3. The Alaska DEW Line Records Search Program included a detailed review of pertinent installation records both government and civilian contractor, contacts with various government and private agencies for documents relevant to the program, and onsite station visits conducted by CH2M HILL during the week of July 29 through August 1, 1981. Activities conducted during the onsite visits included interviews with key station employees, ground tours of station facilities, and plane overflights to identify

past disposal and possible contaminated areas. The stations included in the Records Search Program were:

Station	Geographic Name
BAR-M	Barter Island
POW-3	Bullen Point (Flaxman Island)
POW-2	Oliktok
POW-1	Lonely
POW-M	Point Barrow
LIZ-3	Wainwright
LIZ-2	Point Lay

4. In the event that the Records Search indicates that the potential exists for migration of hazardous contaminants off the installation, Phase II field work would be conducted to confirm the presence of the specific migrating contaminants and to determine the extent of migration. The restoration or containment of the hazardous waste disposal sites would comprise Phase III of the Installation Restoration Program.

B. Conclusions

1. In general, the DEW Line sites were well maintained, with no serious problems. The greatest amount of waste generated by each site consisted mostly of scrap metal which is currently returned to Seattle via sea barge (retrograde). Accidental fuel spills have been a problem in the past, but this is apparently under control. Current disposal practices at DEW Line sites do not significantly cause nor contribute to environmental problems.

- 2. Evidence obtained through interviews with long-time key DEW Line employees indicate that small quantities of hazardous wastes may have been disposed of in the past. Disposal practices in the early 60's included dumping of waste onto the sea ice in winter months.
- 3. An ongoing environmental clean-up program undertaken by FSI under Air Force directive has for the past 3 years resulted in the removal and proper disposal of most wastes which were improperly dumped in the past.
- 4. Where hazardous wastes are present in existing or closed (and cleaned up) dumping sites, there is a low potential for migration of pollutants beyond the boundaries of the stations due to the following reasons:
 - a. Soil permeability in the strata above the permafrost is moderately low.
 - b. The land surface and top of the impermeable permafrost layer is almost flat, providing little hydraulic gradient to facilitate lateral pollutant migration.
 - c. The permafrost layer occurs a few feet below land surface and effectively prevents vertical migration of pollutants.
 - d. The ground is completely frozen at least 8 months out of the year, further reducing the likelihood of pollutant migration.

- 5. Pollution migration is most likely to occur (if at all) during the brief summer months where contaminants may move downgradient above the permafrost table and discharge into streams, ponds, or the sea.
- 6. Table 4 provides a listing of the 44 sites identified during this investigation and their overall rating scores (if rated). The following sites were identified as areas having the highest potential for contaminant migration warranting additional study, arranged by DEW Line site:

BAR-M

Sites No. 1, 4, and 9, past and current dump sites.

Site No. 8, contaminated drainage cut.

Site No. 3, waste petroleum disposal.

POW-3

Site No. 13, old dump site.

POW-2

Site No. 16, old dump site.

POW-1

Site No. 28, fuel storage area, observed contamination.

Sites No. 31 and 32, current and past dump sites.

LIZ-2

Sites No. 40, 43, and 44, current and past dump sites.

7. The following sites are not considered to pose a significant hazard for migration of contaminants and do not warrant additional study:

BAR-M

Sites No. 2 and 12.

POW-2

Sites No. 17 and 20.

POW-1

Sites No. 25 and 29.

POW-M

Site No. 33.

LIZ-3

Sites No. 37, 38, and 39.

8. The following sites were reviewed and deemed to have no potential for migration and were therefore eliminated from further study and not included in the site rating assessment.

BAR-M

Sites No. 5, 6, 7, 10, and 11.

POW-3

Sites No. 14 and 15.

POW-2

Sites No. 18, 19, 21, 22, 23, and 24.

POW-1

Sites No. 26, 27, and 30.

LIZ-3

Sites No. 34, 35, and 36.

LIZ-2

Sites No. 41 and 42.

C. Recommendations

Although little direct evidence of hazardous contaminant migration was found during the Records Search, it is recommended that a very limited program (Phase II) be implemented for puposes of verification. Some disposed material was observed to have migrated offsite. Phase II efforts should include surface-water sampling of shallow ponds and streams near the various sites identified or, where appropriate, soil samples should be collected and analyzed. In addition, the ongoing environmental clean-up should continue in order to remove any possible sources of contamination. Additional study at each site should be as follows:

BAR-M

- o Soil sampling at Sites No. 1 and 4.
- o Surface-water sampling at Sites No. 8 and 9.

POW-3

o Surface-water sampling at Site No. 13.

POW-2

o Surface-water sampling at Site No. 16.

POW-1

o Surface-water sampling at Sites No. 28, 31, and 32.

LIZ-2

o Surface-water sampling at Sites No. 40, 43, and 44.

In the event that contaminants are detected from water/ soil samples collected during this effort, more extensive field efforts may be necessary to quantify the extent of migration. Details of the program outlined above, including the exact location of sampling points, should be finalized as part of the Phase II program. I. INTRODUCTION

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I. INTRODUCTION

A. Background

The Air Force Engineering and Services Center (AFESC) retained the engineering firm of CH2M HILL to assemble a team of experts and conduct a Records Search for the Alaska DEW Line sites. The stations included in the Records Search are BAR-M, POW-1, POW-2, POW-3, POW-M, LIZ-2, and LIZ-3. The POW-3 site was not in operation at the time of the site visit. This site was abandoned in 1971, but still is retained by the Air Force (see Figure 1).

The Alaska DEW Line sites are somewhat unique in that a civilian contractor does all operation and maintenance at the station. The Air Force involvement consists of a contract monitor for the sites, whose tour of duty lasts only one year. The majority of people interviewed as part of the Records Search are employed by the civilian contractor.

The primary legislation governing the management and disposal of solid waste is the Resource Conservation and Recovery Act (RCRA) of 1976. Regulations and implementing instructions for the Act are continuing to be developed by EPA. Under RCRA Section 3012 (Public Law 96-482, October 21, 1981) each state is required to inventory all past and present hazardous waste disposal sites. Section 6003 of RCRA requires Federal agencies to assist EPA and make available all requested information on past disposal practices. It is the intent of the Department of Defense (DOD) to comply fully in these as well as other requirements of RCRA. Simultaneous to the passage of RCRA, the DOD devised a

NOTE: All figures are located in a separate section immediately following the text.

comprehensive Installation Restoration Program (IRP). The purpose of the IRP is to identify, report, and correct environmental deficiencies from past disposal practices that could result in ground-water contamination and probable migration of contaminants beyond DOD installation boundaries. In response to RCRA and in anticipation of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, the DOD issued Defense Environmental Quality Program Policy Memorandum 80-6 (DEQPPM 80-6) on 24 June 1980 which directed the implementation of the IRP program.

The Records Search comprises Phase I of the Department of Defense (DOD) Installation Restoration Program and is intended to review installation records to identify possible hazardous waste contaminated sites. Phase I, the Records Search phase, is the identification of potential problems. Phase II is the quantification of the problem and determination of corrective measures that may be required. The third phase is to contain, correct, and/or mitigate identified potential environmental hazards that may be the result of contaminant migration from the installation.

B. Authority

The identification of hazardous waste disposal sites at military installations was directed by Defense Environmental Quality Program Policy Memorandum 80-6 (DEQPPM 80-6) dated 24 June 1980, and implemented by Air Force message dated 2 December 1980, as a positive action to ensure compliance of military installations with the Resource Conservation and Recovery Act (RCRA) and implementing regulations.

To conduct the Installation Restoration Program Records Search for the Alaska DEW Line sites, the AFESC retained CH2M HILL on May 15, 1981 under Contract No. F08637 80 G0010 0004.

C. Purpose of the Records Search

The main purpose of the Records Search Program is to identify the potential for contamination resulting from past practices of disposal of hazardous and toxic wastes, and to assess the possibility of contaminant migration beyond the installation boundaries. Pertinent information gathered includes the history of operations, the geological and hydrogeological conditions which contribute to the migration of contaminants off the installation, and the ecological settings which indicate sensitive habitats or evidence of environmental stress resulting from contaminants.

D. Scope

The Records Search consisted of a pre-performance meeting, onsite visits, agency contacts, a review and analysis of the information obtained, and preparation of this report.

The pre-performance meeting was held at the office of FELEC Services, Inc. (FSI), Colorado Springs, Colorado, on June 11 and 12, 1981. Attendees at this meeting included representatives of AFESC, Tactical Air Command (TAC), Strategic Air Command (SAC), FSI, Occupational and Environmental Health Laboratory (OEHL), DEW System Office (DSO), and CH2M HILL. The purpose of the pre-performance meeting was to provide detailed project instructions for the Records Search, to develop a project schedule, to provide clarification and technical guidance by AFESC, and to define the responsibilities of the base, the command, the contractor, and AFESC participating in the Alaska DEW Line Records Search.

The onsite station visits were conducted on July 29 through August 1, 1981. Each of the DEW Line Station visits included an aerial tour, an orientation meeting with the respective station supervisor, ground tours of the station,

and interviews with key employees. The following individuals comprised the CH2M HILL Records Search team:

- Mr. Gary E. Eichler, Project Manager/Hydrogeologist (M.S., Engineering Geology, 1974)
- Mr. Brian H. Winchester, Ecologist
 (B.S., Wildlife Ecology, 1973)
- Mr. Gus Andress, Engineer
 (M.S., Environmental Engineering, 1977)
- 4. Ms. Barbara Britt, Technician (Pre-engineering)

Resumes of the key employees are included in Appendix B.

Various government and private agencies were contacted for documents and information relevant to the Alaska DEW Line Records Search effort. Appendix C lists the agencies contacted during the Records Search.

The individuals from the Air Force and FSI who participated in the Alaska DEW Line Records Search included the following:

- Mr. Bob Worchester (FSI)
 Environmental Coordinator
- Capt. Ronald Descheneaux (TAC)
 Command Representative
- 3. Bill Skinner (FSI)
 Acting Area Manager--Alaska DEW Line

E. Methodology

The methodology utilized in the Alaska DEW Line Records Search is shown graphically on Figure 2. First, a review of past and present industrial operations is conducted at the stations. Information is obtained from available records such as shop files and real property files, as well as interviews with key employees from most operating areas of the station.

The next step in the activity review process is to determine the past management practices regarding the use, storage, treatment, and disposal of hazardous materials from the various operations at each DEW Line site. Included in this part of the activities review is the identification of all past landfill sites and burial sites; as well as any other possible sources of contamination such as major PCB or solvent spills, or fuel-saturated areas resulting from large fuel spills or leaks.

An aerial overflight and a general ground tour of identified sites are then made by the Records Search Team to gather site-specific information including (1) evidence of environmental stress, (2) the presence of nearby drainage ditches or surface-water bodies, and (3) visual inspection of these water bodies for any obvious signs of contamination or leachate migration.

A decision is then made, based on all of the above information, whether a potential exists for hazardous material contamination in any of the identified sites. If not, the site is deleted from further consideration. If minor operations and maintenance deficiencies are noted during the investigations, the condition is reported to station supervisor.

For those sites where a potential for contamination is identified, a determination of the potential for migration of the contamination off the installation boundaries is made by considering site-specific soil and permafrost conditions. If there is little potential for contaminant migration, then the site is deleted from further consideration. If the potential for contaminant migration is considered significant, then the site is evaluated and prioritized using the site rating methodology described in Section IV. B "Disposal Sites Identification and Evaluation."

The site rating indicates the relative potential for contaminant migration at each site. For those sites showing a higher potential, recommendations are made to quantify the potential contaminant migration problem under Phase II of the Installation Restoration Program. For those sites showing a medium potential, a limited Phase II program may be recommended to confirm that a serious contaminant migration problem does not exist. For those sites showing a lower potential, no further follow-up Phase II work would be recommended.

II. STATION DESCRIPTIONS

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A. Location

The Alaska DEW Line stations are located in a remote and sparsely populated area at approximately 100-mile intervals across the northern coast of Alaska. The easternmost site is located on Barter Island near the Canadian border and the westernmost site is located at Point Lay. Figure 1 shows the location of each station. The following is a list of the station names, locations, sizes, and number of personnel assigned to each site.

<u>Station</u>	Geographical Name	Number of Acres	Average No. of Station Personnel
LIZ-2	Point Lay	1,442	17
LIZ-3	Wainwright	1,185	17
POW-M	Point Barrow	268	19
POW-1	Lonely	2,830	17
POW-2	Oliktok	2,325	17
POW-3	Bullen Point (Flaxman Island)	620	0
BAR-M	Barter Island	4,353	75

Four of the sites are located near native villages. With the exception of Barrow, the villages have located near the site by choice, the site being there first. Barrow is the largest native Eskimo village in Alaska with a population of approximately 800 people. Barrow is located approximately 4 miles east of POW-M. The village of Kaktouik is located approximately 1 mile south of the main living area at BAR-M and has a native population of approximately 70 people. Wainwright is located approximately 5 miles northeast of LIZ-3 and has a population of approximately 30. The native village of Point Lay is located approximately 1 mile north of LIZ-2 and has a population of approximately 40. POW-1, POW-2, and POW-3 are completely isolated.

B. Organization and Mission

The Alaska DEW Line was the original experimental section which went into operation in 1953; experience there led to construction of the remaining 2,000 miles of the DEW Line across the north coast of Canada. In 1957 it was turned over to a civilian contractor for operation and maintenance.

Today, the Alaska DEW Line is a U.S. Air Force contractoroperated radar/communications network which is part of the
overall TAC/NORAD air defense mission. The DEW System office
is responsible for discharging all contract monitoring
responsibilities of the U.S. Air Force with the contractor
concerning the operation, maintenance, and support of the
Distant Early Warning (DEW) System. The DEW System office
must also ensure adequate support of the contractor in all
areas by military agencies.

The whole DEW Line system for military, functional and operational purposes is divided into six sectors. However, the contractor has been permitted to restructure the DEW Line into four civilian geographical sections for administrative and logistic purposes. Civil Engineering management is provided on the Alaska DEW Line segment from the DEW System office, Colorado Springs, Colorado.

Each section name is derived from its geographical location, e.g., BAR from Barter Island, POW from Point Barrow, and LIZ from Cape Lisburne. Auxiliary sites are designated by a number following the symbol of the next westerly main station. The geographical locations listed for the sites come from the U.S. Geological Survey Quad Sheet on which they are located. The only discrepancy occurs on POW-3, which is listed as Flaxman Island; the site is actually located at Bullen Point rather than Flaxman Island.

The contractor is responsible for maintenance management of real property facilities, which include the buildings, roads, grounds, aircraft facilities, antenna structures, utility plants, and systems of supply, generation, or disposition of electricity, water, sewage, and refuse. These responsibilities are carried out at each site through the station supervisor and the area manager for the Alaska DEW Line sites.

The Alaska DEW Line receives support from the U.S. Air Force in this sector from two officers who function as contract monitors for the sites LIZ-2 to BAR-M. The POW-M site also receives support from the U.S. Navy on portions of their operation and maintenance, as does POW-1, where Husky Oil (a private company) takes responsibility for all refuse control.

The primary mission of the Distant Early Warning System is to detect and report all airborne vehicles operating within the designated detection capabilities of the 31 surveillance radars (6 of which are located on the Alaska DEW Line) regardless of direction and movement. Also, this mission includes the operation and maintenance of the DCS communications network, which is a part of the overall TAC/NORAD air defense mission.

III. ENVIRONMENTAL SETTING

III. ENVIRONMENTAL SETTING

A. <u>Meteorological Data</u>

The Alaska DEW Line stations are located in the climatic zone called the Arctic Region. This type of environment consists of cold average temperatures with strong northern winds blowing across the station locations. Although the region is continuously wet in summer and dotted with lakes, the amount of precipitation is low. Therefore, this region is classified as a frozen desert.

Average minimum and maximum temperatures along the north coast of Alaska are -25° and +44°F, respectively. Summer minimum temperatures drop below freezing. Table 1 lists temperature ranges at selected stations.

In the Arctic Region, wind chill temperature values are more important to terrestrial biological systems than the free air temperature. Strong winds coupled with cold winter temperatures can cause the wind chill factor to reach below -100°F.

Another factor in the long cold winters at the DEW Line stations is loss of solar energy due to lack of sunlight. For example, at Barrow the sun sets on November 18 and does not rise again until January 24, with an elapsed time of 66 days. During this time only a short period of twilight or indirect sunlight occurs. However, cloud cover and warm winds generated in lower latitudes (westerlies) flowing across the coast somewhat moderate the temperatures during the winter. During the summer months at Barrow, the sun rises May 10 and does not set until August 2, with an elapsed time of 84 days. Even with the increased amount of sunlight, very little of the energy reaches the surface because of the extensive cloud cover that absorbs or reflects the light.

Table 1
AVERAGE TEMPERATURES AT SELECTED DEW LINE STATIONS

•	Summer		Winter		
Stations	Average Minimum (°F)	Average Maximum (°F)	Average Minimum (°F)	Average Maximum (°F)	Extremes (°F)
BAR-M, Barter Island	30	46	-20	-6	-59 to 75
POW-2, Oliktok ^a	30	47	-24	-6	-49 to 75
POW-M, Barrow	29	44	-25	-6	-56 to 78
LIZ-3, Wainwright	30	49	-26	-6	-56 to 80
LIZ-2, Point Lay	32	53	-27	-5	-55 to 78

^aOnly limited data available, may not necessarily represent average conditions.

NOTE: Period of record is from 1959 to 1974 except for Oliktok. SOURCE: Alaska Regional Profiles, The University of Alaska, Arctic Environmental and Data Center, 1975.

Average precipitation along the Alaska DEW Line is generally low, about 5 to 7 inches per year. Most of the precipitation occurs as rain during the summer. The average amounts of precipitation at selected stations are shown below:

Station	Amount of Precipitation			
BAR-M, Barter Island	7" (includes 45" of snow)			
POW-2, Oliktok	5" (includes 19" of snow)			
POW-M, Barrow	5" (includes 29" of snow)			
LIZ-3, Wainwright	6" (includes 12" of snow)			
LIZ-2, Point Lay	7" (includes 21" of snow)			

Source: Alaska Regional Profiles, The University of Alaska,

Arctic Environmental and Data Center, 1975.

Note: Approximately 10 inches of snow equals 1 inch of water.

B. <u>Geology</u>

The DEW Line radar installations are situated in the Arctic Coastal Plain physiographic region. The major physiographic features of the Arctic region are illustrated on Figure 3.

The Coastal Plain is a smooth surface showing little relief, sloping downward to the north from the foothills of the Brooks Range. Due to the flat terrain and the continuous occurrence of permafrost, marshes and lakes are abundant. Permafrost refers to naturally occurring earth materials whose temperature is below 32°F year round. The coastline is characterized by low coastal banks with narrow gravel beaches. Coastal erosion occurs as thermal undercutting of

the frozen bank and slumping into the sea. The Alaska DEW Line sites are at elevations of approximately 5 to 80 feet above msl.

The surficial soil that predominates at all the sites is a poorly drained peat with a silty loam texture. Polygonal surface patterns are abundant, and the permafrost table is near the surface. Underlying the soil are Quaternary and Recent unconsolidated sand, gravel, silt, and clay of the Gubik Formation. Their thickness varies from a few feet to 150 feet, and the beds occur as lenses and mixtures of sediment. The formation was deposited in a shallow, near-shore shelf marine environment. Frequent sea level changes alternately exposed and inundated the coastal plain depositing, reworking, and mixing the sediments. The formation may locally be modified by alluvial, eolian, lacustrine, and frost processes.

At LIZ-2 the formation is more silty than at the other DEW Line sites, and at LIZ-3 the unconsolidated sediments have been eroded away by the Kuk River to expose the underlying consolidated Cretaceous and Jurassic sandstones, shales, and conglomerates. Figure 4 shows the general geology at the surface throughout the Arctic region.

Tertiary, Cretaceous, and Jurassic sandstones, siltstones, shales, and conglomerates underlie the unconsolidated sediments throughout the coastal plain. This strata is from 2,000 to 12,000 feet thick along the coastal margin and generally thickens toward the foothills to the south. It is underlain by more predominantly deep water sediments: limestone, siltstone, shale, and sandstone. Below this strata are metamorphics of the Devonian period and older, which comprise the basement rock and are predominantly quartzite schists, marble, and slate. Figure 5 is a north-south cross section through Barrow (POW-M) showing the general configuration of the geology to bedrock.

C. Hydrology

The DEW Line sites are all located within a few thousand feet of the Arctic Ocean. Surface drainage occurs as sheetflow and shallow creek runoff from near the coast. Infiltration also may occur to a limited extent down to the permafrost table in the summer months.

Numerous rivers, originating in the Brooks Range and the foothills, cross the coastal plain and empty into the Arctic Ocean. The rivers west of the Colville River exhibit drowned coastal features indicating subsidence of the coastal plain, whereas the Colville and rivers east are building deltas into the ocean, an emergence feature.

Thousands of lakes occur on the coastal plain and are known as "thaw lakes." These are thermokarst features and are formed where water collects in a ground surface depression. The permafrost beneath the pool melts, and the lake starts expanding as the melting continues at the lake margins. When the lake intersects lower ground and drains, the area becomes a marsh and may refreeze. These lakes are generally less than 10 feet deep and remain frozen 9 months of the year.

The water supplies for each of the sites are from nearby freshwater lakes. Of all the sites, POW-M is the most susceptible to water quality deterioration from saltwater spray or flooding. Due to the low elevations of LIZ-2, POW-M, and POW-2, these installations are moderately susceptible to coastal flooding.

Runoff at the sites follows natural depressions, improved ditches, and also occurs as sheetflow. Figures 6 through 13 show the general drainage patterns at each site.

The presence of permafrost throughout the region limits the development of ground water to virtually nil. The top of the permafrost table occurs near the surface to a depth of approximately 20 feet, and the ground is permanently frozen to depths in excess of 1,300 feet near the coast. Figure 14 illustrates the extent of permafrost within the region and the recorded depth of the bottom of frost at selected sites.

Permafrost and frost action are responsible for many of the features in the coastal plain. Pingos and frost mounds are rounded hills of various size formed when thaw lakes drain, leaving marshy ground. When permafrost encroaches, the expansion of the water as it freezes pushes the center of the area upward, forming an ice core hill.

Polygonal or patterned ground occurs when the ground contracts and cracks during the winter. Snow and water accumulate in the cracks and during the following winter expand and force material vertically. In marshy areas, the ridges continue to grow in height. In well drained areas, the cracks form natural drainage channels and subside relative to the center of the polygon. Thaw lakes often form in the depressed center of a polygon in poorly drained areas.

The only ground water that is potentially developable occurs within the thaw bowl present under larger lakes, streams, and rivers. Some wells have been constructed in the thaw areas near stream channels and lakes, but long-term effectiveness of these wells is unknown.

Due to the occurrence of permafrost at all the sites, any water or contaminant placed on the ground or in the soil will not infiltrate deeper than the seasonally active layer of the frost. There it may be frozen and remain in place or (during the summer seasons) may move downgradient and discharge

into streams, ponds, or the ocean. The estimated permeability of this upper material is from 0.1 to 0.0001 cm/sec (0.2 to 0.0002 ft/min). The wide range is due to the high variability of grain size and mixture. This permeability ranges from moderately high to moderately low.

D. Environmentally Sensitive Conditions

The natural habitat at all of the DEW Line sites may be characterized as either wet or moist tundra. Both of these habitats support low growths of herbaceous and woody species such as cottongrass (Eriophorum spp.), sedges (Carex spp.), rushes (Juncus and Luzula spp.), saxifrages (Saxifraga spp.), cloudberry (Rubus chamaemorus), dwarf willows (Salix spp.), and various mosses and lichens. Although these habitats are relatively intolerant to physical disturbance, their extensive distribution around all of the DEW Line installations makes such disturbance less significant. Spills of fuel oil or other petrochemical products on tundra is detrimental, though tundra vegetation is generally able to recover with time; no long-term adverse effects were noted during site visits.

Small lakes and shallow wetlands occur in the vicinity of all of the installations, and these should be considered environmentally sensitive to chemical or other hazardous substances. Such systems are affected to a much greater degree than surrounding terrestrial tundra habitats, and adverse effects are also typically much longer-lived.

Although any potential local effect of contaminant release to the Arctic Ocean (or its tributaries) is partially mitigated by dilution processes, significant contamination may nevertheless result in accumulation of hazardous substances up the food chain. Consequently, the Arctic Ocean and all adjoining tributaries and other waters are considered environmentally sensitive habitats.

Three species listed as endangered by the U.S. Fish and Wildlife Service occur in Alaska: the peregrine falcon (Falco peregrinus), Aleutian Canada goose (Branta canadensis leucopareia), and eskimo curlew (Numenius borealis). Of these, only the peregrine falcon is likely to occur in the vicinity of DEW Line installations. It should be noted that species such as the bald eagle, gray wolf, and grizzly bear do not have endangered/threatened status in Alaska.

IV. FINDINGS

IV. FINDINGS

A. Activity Review

Major activities common to all DEW Line stations which generate significant industrial wastes are operation of the EWS and communication systems, power generation, and intermediate level maintenance (including maintenance and operation of vehicles). In the past the general procedure for all solid and liquid waste disposal was to transport it to the landfill, or in some cases to dispose of materials in shoreline ravines or out on the sea ice (so that it sank when the ice melted). The procedure now used is to package or redrum all solid or liquid chemical wastes inappropriate for incineration and to ship them out via sea lift to Seattle, annually. Some open burning still occurs (permitted by the State of Alaska on the DEW Line to burn up to 100 gallons of waste fuel/oil at a time) in station landfills. All sites have incinerators; however, the BAR-M incinerator is not large enough to handle site and village of Kaktovik waste. some burning is still done at the dump site. Other sites which have adequate incineration facilities include LIZ-2, LIZ-3, POW-1, and POW-2.

Operation of the EWS periodically generates waste electrical or communications hardware in the form of telephone units, teletype cabinets, radio transmitters, radar components, Klystron tubes, mercury and low-level radioactive tubes, and lead storage batteries. Most of this material is now retrograded meaning to return to Seattle by way of barge annually. Solvents used in servicing and cleaning equipment include 1-1-1 trichlorethane, dichlorethane, methyl ethyl ketone, trichlorethylene, and acetone. Waste solvents are now drummed and shipped out for proper disposal. In the past they were likely disposed of in the dump site.

Tropospheric Scatter Communication facilities and other portions of the EWS contain a variety of transformers, capacitors, and rectifiers. Many of these are nitrogen filled, but some contain dielectric fluid. In some cases the dielectric fluid is known to contain PCBs, but in other cases it was not clear from records or interviews whether PCBs are present. Although there is no documentation of any PCB transformers, capacitors, or rectifiers going to landfills at the various sites, it is likely that some did in the past. It is known that transformers have been replaced at POW-1 and LIZ-2 in the past.

Heat exchange systems are periodically flushed with sulfamic acid to control scaling/corrosion. The fluid is then neutralized with sodium bicarbonate prior to discharge to the tundra. The resultant discharge should pose no serious environmental problem.

Wastes associated with power generation include waste (or spilled) fuels and oils, solvents, thinners, degreasers, possibly some capacitors or transformers, and deteriorated asbestos insulation. Interviews indicated that fuel oil spills have occurred at POW-M, POW-1, POW-2, and LIZ-3. Two spills occurred at POW-M; in 1973 a minor spill resulted from the movement of an improperly secured rubber fuel bladder, and a larger spill (date and amount unspecified) occurred in the vicinity of the hangar. POW-1 had a minor break in a fuel line in 1978, resulting in a spill of unspecified magnitude. In 1978, POW-2 also had a corosioninduced break in a fuel line, spilling roughly 300 gallons into a small tundra pond. The largest spills occurred at LIZ-3, when on two separate occasions roughly 10,000 gallons of fuel oil were spilled under the power house. A minor oil spill (5 gallons) also occurred at LIZ-2 with some resultant contamination of the adjoining lagoon. No direct evidence was observed from these spills during site visits except

where fuel/oil was currently being placed. Fuel filters are presently disposed of by incineration. Power house engines are generally given oil changes every 1,000 hours; waste oils are either burned or retrograded.

Once again, many of the capacitors and transformers in the power houses are nitrogen filled, but the presence or concentrations of PCBs in those containing dielectric fluid are not known. Breaker switches containing dielectric fluid are also present. BAR-M currently has some capacitors and transformers with small leaks. Deteriorated asbestos insulation is disposed of in landfills.

Although depot level maintenance activities have been curtailed (being concentrated at BAR-M) at many of the sites, some functions still continue, as does vehicle maintenance. Many of the solvents already listed have been utilized (including also carbon tetrachloride) but 1-1-1 trichlorethane is now probably the most commonly used (based on examinations of stock supply). Waste solvents are drummed and retrograded. Paint thinners are also used in equipment maintenance, as is some lead-based paint.

In many of the DEW Line stations, private contractors or other non-military/non-FSI personnel have stored private fuel supplies adjacent to hangar or runway facilities. These are generally not used by pilots after one year and thus in a sense have been abandoned. Oil barrels leaking onto the tundra were noted at POW-1 and POW-2. Table 2 lists possible materials which could be in dump sites at any of the stations. Records of use, time of use and quantities were unavailable.

Table 2 LIST OF POSSIBLE MATERIAL IN DISPOSAL SITES ON ALASKA DEW LINE

Waste oils Transmission fluids PCB transformers/capacitors 1-1-1 Trichloroethane Trichloroethylene Asbestos Old PBX telephone equipment Sewage Mercury vapor rectifier tubes Lead base paints Paint thinners Radioactive tubes Batteries Scrap metal Chlorinate hydrocarbons Radar components Calgon corrosion inhibitor 55 gallon drums (empty) Lye Lime Corrosives Antifreeze Paper Wood Plastics **AVGAS** Valvolium (solvent) Sulfamic acid Dynamite Cathode ray tube screens RF interference filters (filters containing small amounts of PCBs) Filtron tubes Generators Oscillators Scopes Meters Vehicles Trash Copper wire Rubber (fuel or water bladders) Tin cans Bottles

SOURCE: Interviewees.

B. <u>Disposal Sites Identification and Evaluation</u>

Interviews with past and present key employees of both the Air Force and FSI resulted in the identification of 44 sites along the Alaska DEW Line which were reviewed during this study. The sites included 14 current or former landfills, and 9 spills or other possible contaminated area sites. Also identified from interviews and site inspection were 21 sites where chemical and petroleum were stored and might have a potential for migration.

These sites, illustrated on Figures 15 through 22, were reviewed and those which had a potential for migration were evaluated using a rating system for prioritized ranking of the hazard potential of waste disposal facilities developed by JRB Associates, Inc., of McLean, Virginia, for the U.S. Environmental Protection Agency. This system was modified by CH2M HILL and Engineering Science for specific application to the Air Force Installation Restoration Program.

The JRB system consists of 31 rating factors divided into 4 categories, receptors, pathways, waste characteristics, and waste management practices, which are used to evaluate the principal targets of contamination, the mechanisms for migration, the hazards posed by the contaminants, and the facilities design and operation, respectively. Relative scores from each category are combined to give an overall score using appropriate weighting factors. A more detailed description of this hazard evaluation methodology is included in Appendix E.

The following is a brief description of each site identified during the Records Search and site visit along the Alaska DEW Line. Copies of the rating forms completed for each site which was rated are included in Appendix F. A summary of the results of the site assessment, using the modified rating system, is given on Table 3.

Table 3 SUMMARY OF RESULTS OF SITE ASSESSMENTS^A

	Average Score (Weighted Average)	4.6.4.4.6.4.6.9.9.9.9.9.9.9.9.9.9.9.9.9.	45	45 39 26	28 36 36 44
Subscores (%) of Maximum Possible Score in Each Act	Score in Each Category Waste Management tics Practices 0.24	51 41 51 7 48	57	57 40 7	26 26 19 57 51
		50 50 50 50 50 50	20	50 40 50	30 50 50 50
		49 31 54 31 31	46	46 46 26	29 61 44 46
	Receptors 0.22	29 29 29 25 29 ip 40	. 29	25 22 23 24	29 29 29 29
	Site Description	Old Dump Site Sewage Lagoon Waste Petroleum Disposal Current Dump Site Drainage Cut Contamination Old Dump SiteN.W.	Old Dump SiteEast	Old Dump SiteN.W. Current Dump Site Fuel Oil Spill	Sewage Disposal Area POL Storage Area Diesel Fuel Spill Old Dump Site Husky Dump Site
	Site No.	1 2 8 8 9 12 12 12 12 12	13 POW-2	16 17 20 POW-1	25 28 29 31 32

		Subscores	(%) of Maxin	Subscores (%) of Maximum Possible Score in Each Category	in Each Category	
Site Description		Receptors 0.22	Pathways 0.30	Characteristics	Practices 0.24	Average Score (Weighted Average)
Diesel Fuel Storage		16	53	50	26	30
Fuel Spills Power House 25	7	ĸ	38	20	16	33
	5	~	56	20	34	33
Old Dump SiteSouth 26	26		29	20	41	36
	26		52	20	56	48
Old Dump SiteNorth 32	32		40	20	57	45
	æ	~	40	20	57	45

^aBasis of rating system developed by JRB Associates, Inc., of McLean, Virginia, and modified by CH2M HILL band Engineering-Science for application to Air Force Installation Restoration Program Records Search.

^bSites 5, 6, 7, 10, 11, 14, 15, 18, 19, 21, 22, 23, 24, 26, 27, 30, 34, 35, 36, 41, and 42 were eliminated from further study and therefore not rated. Figures 15 through 22 illustrate site locations.

1. Landfills/Dump Sites

The landfills/dump sites identified at the Alaska DEW Line sites include initial construction type dump sites and current active dump sites, some of which are used by nearby native villages. Some of the older sites have been cleaned up as a result of an ongoing environmental clean-up project.

In most cases, the current dump sites are less than 1 acre in size. The exception is the dump site at BAR-M which is also used by the native village of Kaktovik. The dump sites are operated by digging into the tundra to the permafrost (2 to 3 feet) and disposing of waste in the trench. The waste is either burned and covered or covered with excavated materials or gravel brought in from some other part of the site. The exception is LIZ-2 whose dump site is located behind the site hangar at the edge of a cliff bordering Kasegaluk Lagoon.

The 14 sites that were identified and the approximate dates that these sites were in operation are summarized on Figure 23. Site descriptions are as follows:

BAR-M--Figures 15 and 16

o Site No. 1, located north of the fuel storage area at BAR-M between the sewage pond and the Beaufort Sea, is where the old dump site was used from 1956 to 1978. This site received all wastes generated at BAR-M and the village of Kaktovik located adjacent to the site.

The site received domestic garbage, human and animal waste, waste POL products, scrap metal, batteries, drums, vehicles, electronic equipment, food waste, trash, and all other

waste generated by the site or the village. Disposal at this site included dumping directly into the Beaufort Sea. This site was approximately 2 acres in size and was included in an environmental clean-up project where most of the materials dumped at this site were removed (see photos in Appendix A).

- Site No. 4 is the location of the current dump site used by both BAR-M and the village of Kaktovik. This site has been in operation since June, 1978 and is approximately 2 acres in size. Disposal at the site by BAR-M personnel is controlled and is in compliance with DEW Line Instruction 825.620 dated May 11, 1979. However, the disposal of materials by the village is uncontrolled (see photos in Appendix A).
- o Site No. 9 is located approximately 1.7 miles west of the current dump site (Site No. 4). The site was used briefly by BAR-M for disposal of crushed drums and steel from a burned building. This site was less than 1 acre in size and was cleaned up in 1979 when approximately 15 tons of scrap metal was removed.
- o Site No. 12 is an old dump site, probably used during construction (1953-1956) and for some short period thereafter. This site received construction debris, old vehicles, drums, and all other wastes generated during this period. Dumping occurred out into the sea, especially during winter months. This site was approximately 2 acres in size and was cleaned up in 1979-80.

POW-3--Figure 17

o Site No. 13 is a dump site used from 1956 until 1971, when the station was deactivated (see photos in Appendix A). The site is less than 1 acre in size.

POW-2--Figure 18

- o Site No. 16 is an old dump site which received all waste generated by the site from 1956 to approximately 1978. It was cleaned up in 1978, 1979, and 1980. The site was less than 1 acre in size.
- o Site No. 17 is a current dump site, modified from an old dump site in 1980. The site is less than 1 acre in size.

POW-1--Figure 19

- o Site No. 31 is an old dump site used prior to approximately 1976. After 1976, site waste disposal was handled by Husky Oil Co. (see photos in Appendix A). This site is less than 1 acre in size.
- o Site No. 32 is a current dump site maintained and operated by Husky Oil Co. It is located approximately 1 mile southwest of the site, on Air Force property, and has been in use since 1976. This site is less than 1 acre in size.

POW-M--Figure 20

Naval Arctic Research Lab (NARL) handles waste disposal for the site. Disposal is at Barrow Municipal Dump which is located approximately 2 miles from the site also used by native villagers.

LIZ-3--Figure 21

- o Site No. 38 is a current dump site. It has been in use since 1974.
- o Site No. 39 is an old dump site located approximately 2 miles south of site. It was closed in 1974 and cleaned up in 1979-80.

LIZ-2--Figure 22

- o Site No. 40 is a current dump site and has been used since 1978.
- o Site No. 43 is an old dump site and has been used from 1956 to 1978. It was cleaned up in 1979-80.
- o Site No. 44 is an old dump site used by villagers and the site from 1956 to 1980. It was cleaned up in 1979-80.

Spills and Other Possible Contaminated Areas

Nine areas where spills, primarily fuel and other possible contamination, occurred were identified:

BAR-M--Figure 15 and 16

- o Site No. 2 is a sewage lagoon which receives domestic wastewater from the site. The lagoon is excavated to the permafrost at a depth of approximately 4 feet and bermed. The berm and bottom are essentially impermeable; therefore, the lagoon operates by evaporation.
- o Site No. 3 is a small, circular pond approximately 20 feet in diameter and 2 to 3 feet deep. This pond is saturated with diesel fuel and waste oil products and appears to be a disposal site for these products.
- o Site No. 8 is an area where the site (power house) discharges washwater to a natural drainage cut flowing to the sea. There appears to be contaminated liquid, possibly antifreeze, discharged to the drainage cut which eventually goes to the sea.

POW-2--Figure 18

o Site No. 20 is the site of a 300-gallon diesel fuel oil spill which occurred in September, 1978. There was little or no recovery.

POW-1--Figure 19

o Site No. 25 is a domestic sewage disposal area.

- o Site No. 28 is a petroleum storage area. Fuel/oil was observed to be collecting in an adjacent pond.
- o Site No. 29 is where the fuel line ruptured and approximately 25,000 gallons of diesel spilled onto the ground in 1978 (see photos in Appendix A). There was no recovery.

POW-M--Figure 20

o Site No. 33 is an undiked diesel fuel tank and was the site of a minor fuel spill (approximately 300 gallons) in approximately 1974.

LIZ-3--Figure 21

o Site No. 37 is where two 10,000-gallon fuel spills occurred under the power house module, one in the early 1970's, the other in 1976 (see photos in Appendix A). Approximately 4,000 gallons from the second spill was recovered and used.

Other Sites Reviewed but Not Rated as Hazardous Waste Sites

Twenty-one sites, primarily storage areas, were reviewed during onsite visits and were not rated:

BAR-M--Figures 15 and 16

o Site No. 5 is the location of several large PCB-filled transformers which are in use at the Tropospheric Scatter Communication building.

- o Site No. 6 is a fuel storage tank with no containment berm.
- o Site No. 7 is a storage area for materials scheduled for retrograde by sea lift.
- o Site No. 10 is a tank farm/fuel storage area containing diesel fuel Arctic. Adjacent to the diked enclosure around the tank farm, there is a overflow lagoon which is inadequate to contain fuel from one or more tanks.
- o Site No. 11 is an unbermed diesel fuel tank.

POW-3--Figure 17

- o Site No. 14 is a deactivated drum storage area used to stockpile such fluids as antifreeze, solvents, and lube oil.
- o Site No. 15 is a deactivated undiked fuel storage area.

POW-2--Figure 18

- o Site No. 18 is a dock storage area.
- o Site No. 19 is a petroleum products storage area.
- o Site No. 21 is a drum storage area containing such fluids as antifreeze, solvents, and lube oil soap.
- o Site No. 22 is a diesel fuel storage area.

POW-1--Figure 19

- o Site No. 23 is a gasoline storage and material storage area.
- o Site No. 24 is a diesel fuel storage area.
- o Site No. 26 is a drum storage area (see photos in Appendix A).
- o Site No. 27 is diesel fuel beach storage tanks.
- o Site No. 30 is a vehicle and equipment storage area.

LIZ-3--Figure 21

- o Site No. 34 is a diesel fuel storage area.
- o Site No. 35 is a drum storage area.
- o Site No. 36 is a gasoline storage area.

LIZ-2--Figure 22

- o Site No. 41 is a gasoline/fuel storage area.
- o Site No. 42 is a diesel fuel and drum storage area.

V. CONCLUSIONS

V. CONCLUSIONS

- A. In general, the DEW Line sites were well maintained, with no serious problems. The greatest amount of waste generated by each site consisted mostly of scrap metal, which is currently retrograded back to Seattle. Accidental fuel spills have been a problem in the past but this is apparently under control. Current disposal practices at DEW Line sites would not cause nor contribute to significant environmental problems.
- B. Evidence obtained through interviews with long-time key DEW Line employees indicates that small quantities of hazardous wastes may have been disposed of in the past. Disposal practices in the early 1960's included dumping of waste onto the sea ice in winter months.
- C. An ongoing environmental clean-up program undertaken by FSI under Air Force directive has for the past 3 years resulted in the removal and proper disposal of most wastes which were improperly dumped in the past.
- D. Where hazardous wastes are present in existing or closed (and cleaned-up) dumping sites, there is a low potential for migration of pollutants beyond the boundaries of the stations for the following reasons:
 - 1. Soil permeability in the strata above the permafrost is moderately low.
 - 2. The land surface and top of the impermeable permafrost layer is almost flat, providing little hydraulic gradient to facilitate lateral pollutant migration.

- 3. The permafrost layer occurs a few feet below land surface and effectively prevents vertical migration of pollutants.
- 4. The ground is completely frozen at least 8 months out of the year, further reducing the liklihood of pollutant migration.
- E. Pollutant migration is most likely to occur (if at all) during the brief summer months where contaminants may move downgradient above the permafrost table and discharge into streams, ponds, or the sea.
- F. Table 4 lists the 23 sites identified and rated during this investigation and their overall rating scores.

 The following sites were identified as areas having the highest potential for contaminant migration, warranting additional study, arranged by DEW Line site:

BAR-M

- 1. Sites No. 1, 4, and 9, past and current dump sites, due primarily to:
 - o Proximity to Beaufort Sea
 - o Suspected small quantities of hazardous waste
- 2. Site No. 8, contaminated drainage cut, due primarily to:
 - o Proximity and discharge to Beaufort Sea
 - o Suspected small quantities of hazardous waste

Table 4 PRIORITY LISTING OF RATED SITES

Site No.	Site Description	Overall Score
	SITES WARRANTING LIMITED ADDITIONAL STUDY	
BAR-M		
4	Current Dump Site	47
1	Old Dump Site	45
3	Waste Petroleum Disposal	44
9	Old Dump Site, N.W.	40
8	Drainage Cut Contamination	36
POW-3		
13	Old Dump SiteEast	45
POW-2		
16	Old Dump SiteNW	45
POW-1		
31	Old Dump Site	46
32	Husky Oil Dump Site	44
28	POL Storage Area	43
LIZ-2		
40	Current Dump Site	48
43	Old Dump SiteNorth	45
44	Suspected Dump Site	45

Site No.	Site Description	Overall Score
	SITES NOT WARRANTING ADDITIONAL STUDY	
BAR-M		
2 12	Sewage Lagoon Old Dump Site Near Air Strip	34 39
POW-2		
17 20	Current Dump Site Fuel Oil Spill	39 26
POW-1		
29 25	Diesel Fuel Spill Sewage Disposal Area	36 28
POW-M		
33	Diesel Fuel Storage	30
LIZ-3		
39 38 37	Old Dump SiteSouth Current Dump Site Fuel SpillsPower House	36 33 33

NOTE: Sites 5, 6, 7, 10, 11, 14, 15, 18, 19, 21, 22, 23, 24, 26, 27, 30, 34, 35, 36, 41, and 42 were eliminated from further study and not rated.

- 3. Site No. 3, waste petroleum disposal, due primarily to:
 - o Proximity to Beaufort Sea
 - o Observed contamination

POW-3

- 1. Site No. 13, old dump site, East, due primarily to:
 - o Proximity to Mikkelsen Bay
 - o Suspected small quantities of hazardous waste

POW-2

- 1. Site No. 16, old dump site, N.W., due primarily to:
 - o Proximity to the Beaufort Sea
 - o Suspected small quantities of hazardous waste

POW-1

- Sites No. 31 and 32, current and past dump sites, due primarily to:
 - o Proximity to the Beaufort Sea
 - o Suspected small quantities of hazardous waste
- 2. Site No. 28, current POL storage area, due primarily to:

- o Observed contamination
- o Proximity to surface water

LIZ-2

- 1. Site No. 40, current dump site, due primarily to:
 - o Direct disposal into Kasegaluk Lagoon
 - o Suspected small quantities of hazardous waste
- 2. Sites No. 43 and 44, old dump sites, due primarily to:
 - o Proximity to populated area (nearby village)
 - o Proximity to Kasegaluk Lagoon
 - o Suspected small quantities of hazardous waste
- G. The following sites are not considered to pose a significant hazard for migration of contaminants and do not warrant additional study:

BAR-M

Sites No. 2 and 12.

POW-2

Sites No. 17 and 20.

POW-1

Sites No. 25 and 29.

POW-M

Site No. 33.

LIZ-3

Sites No. 37, 38, and 39.

H. The following sites were reviewed and deemed to have no potential for migration and were therefore eliminated from further study and not included in the site rating assessment.

BAR-M

Sites No. 5, 6, 7, 10, and 11.

<u>POW-3</u>

Sites No. 14 and 15.

POW-2

Sites No. 18, 19, 21, 22, 23, and 24.

POW-1

Sites No. 26, 27, and 30.

LIZ-3

Sites No. 34, 35, and 36.

LIZ-2

Sites No. 41 and 42.

VI. RECOMMENDATIONS

VI. RECOMMENDATIONS

Little direct evidence of hazardous contaminant migration was found during the Records Search, it is recommended that a very limited program (Phase II) be implemented for purposes of verification. Some disposed material was observed to have migrated offsite. Phase II efforts should include surface-water sampling of shallow ponds and streams near the various sites identified or where appropriate soil samples should be collected and analyzed. In addition, the ongoing environmental clean-up should continue in order to remove any possible sources of contamination. Additional study at each site should be as follows:

BAR-M

- o Site No. 1, old dump site--Collect soil samples at 2-foot intervals from land surface to the permafrost at a point 20 feet north of the north edge of the dump site. Analyze soil samples for heavy metals, PCBs, phenols, volatile organic compounds, and pH.
- o Site No. 3, waste petroleum disposal--collect water sample and analyze for oils and greases and volatile organic compounds.
- o Site No. 4, current dump site--Similar to Site No. 1 above.

Note: Heavy metals analyses should include total chromium, hexavalent chromium, cadmium, lead, mercury, selenium, and silver.

- o Site No. 8, drainage cut contamination--Collect a water sample from this drainage ditch. Analyze sample for heavy metals, pH, oil and grease, PCBs, phenols, solvents, volatile organic compounds and specific conductance.
- o Site No. 9, old dump site, N.W.--Collect water sample from downstream side of disposal area in drainage ditch. Analyze sample for heavy metals, PCBs, volatile organic compounds, pH, and specific conductance.

<u>POW-3</u>

o Site No. 13, old dump site, East--Collect surface-water sample from nearby pond. Analyze sample for heavy metals, PCBs, phenols, pH, volatile organic compounds, and specific conductance.

POW-2

Site No. 16, old dump site, N.W.--Collect water sample from downstream side of dump site. Analyze sample for heavy metals, phenols, pH, volatile organic compounds, and specific conductance.

POW-1

- o Site No. 28, POL storage area--Collect water sample from small pond area adjacent to storage area. Analyze sample for oils and grease and TCE.
- o Site No. 31, old dump site--Collect water sample from nearby saltwater pond adjacent to site of old dump. Analyze sample for heavy metals, PCBs, phenols, pH, and volatile organic compounds.

o Site No. 32, Husky Oil dump site--Collect water sample from the pond area adjacent to the dump site. Analyze sample for heavy metals, PCBs, phenols, pH, volatile organic compounds, and specific conductance.

LIZ-2

- o Site No. 40, current dump site--Collect water sample from Kasegaluk Lagoon adjacent to the dump site. Analyze sample for heavy metals, phenols, pH, and volatile organic compounds.
- o Sites No. 43 and 44, both old dump sites adjacent to the same small pond--Collect water sample from pond. Analyze sample for heavy metals, phenols, pH, and volatile organic compounds.

In the event that contaminants are detected from water/ soil samples collected during this effort, more extensive field efforts may be necessary to quantify the extent of migration. Details of the program outlined above, including the exact location of sampling points, should be finalized as part of the Phase II program. REFERENCES

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- 4. Bird, Kenneth J. "Petroleum Exploration of the North Slope in Alaska, U.S.A.," U.S. Department of the Interior, Geologic Survey, Open File Report 81-227, February, 1981.

FIGURES

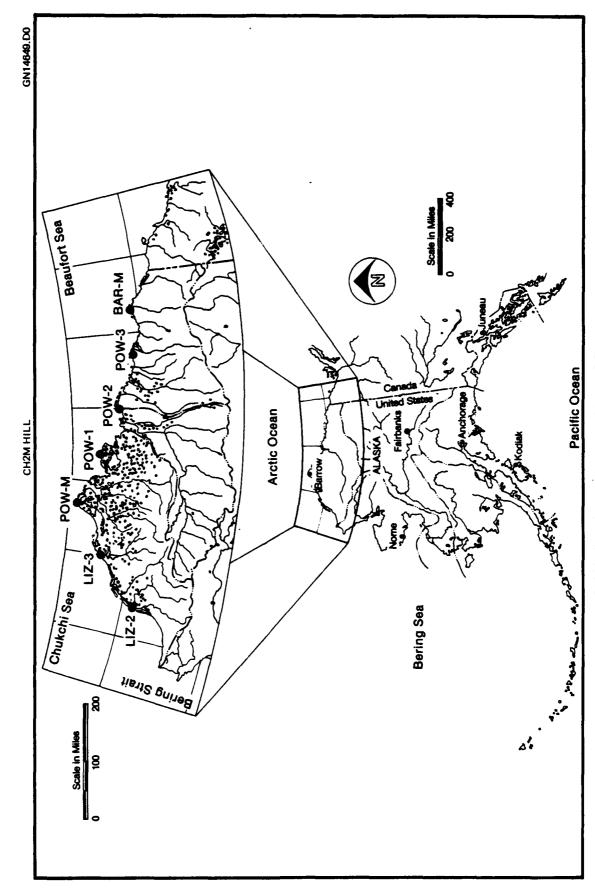


FIGURE 1. Location map—Alaska DEW Line.

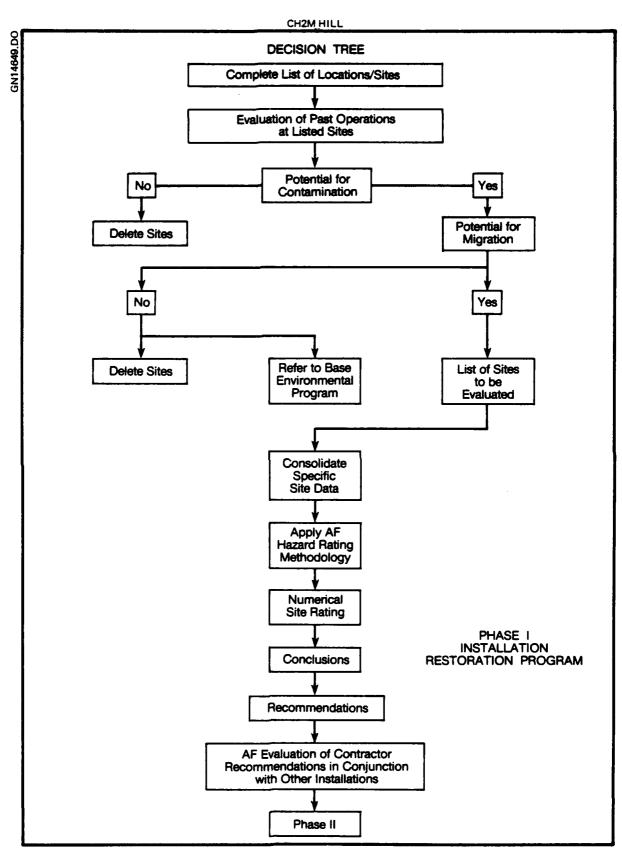


FIGURE 2. Records Search Methodology.

FIGURE 3. Physiographic map.

FIGURE 4. Geologic map.

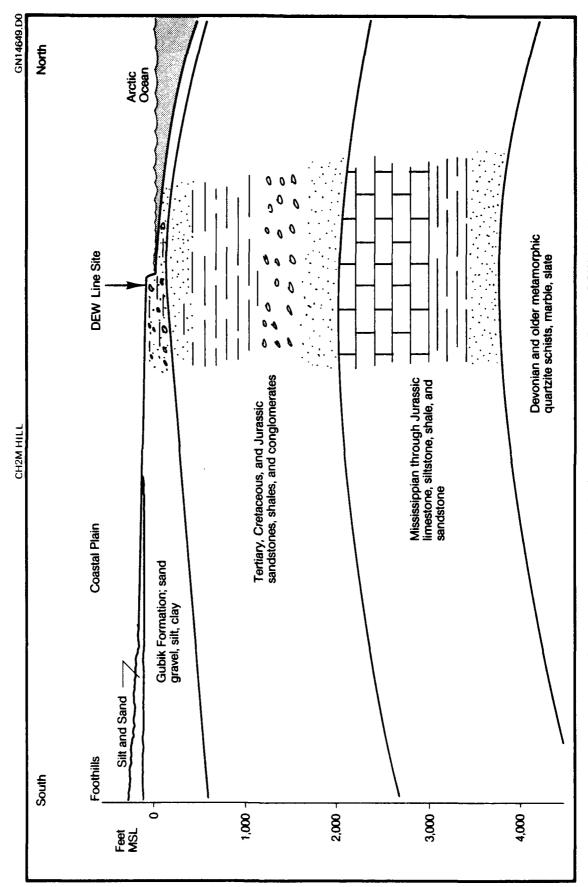


FIGURE 5. North-south geologic cross section through Barrow POW-M. (Not to scale)

FIGURE 6. Surface drainage map of BAR-M.

FIGURE 7. Surface drainage map of BAR-M airstrip.

FIGURE 8. Surface drainage map of POW-3.

FIGURE 9. Surface drainage map of POW-2.

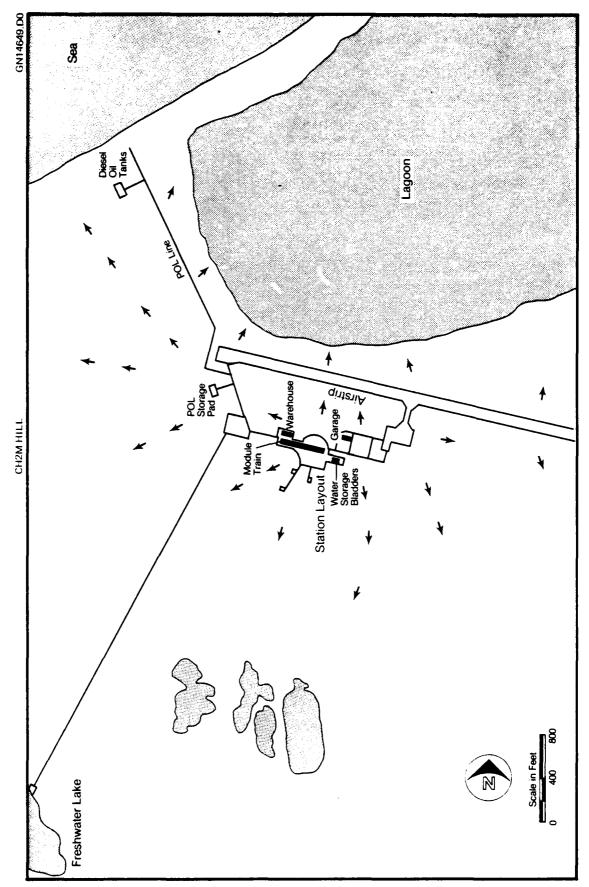


FIGURE 10. Surface drainage map of POW-1.

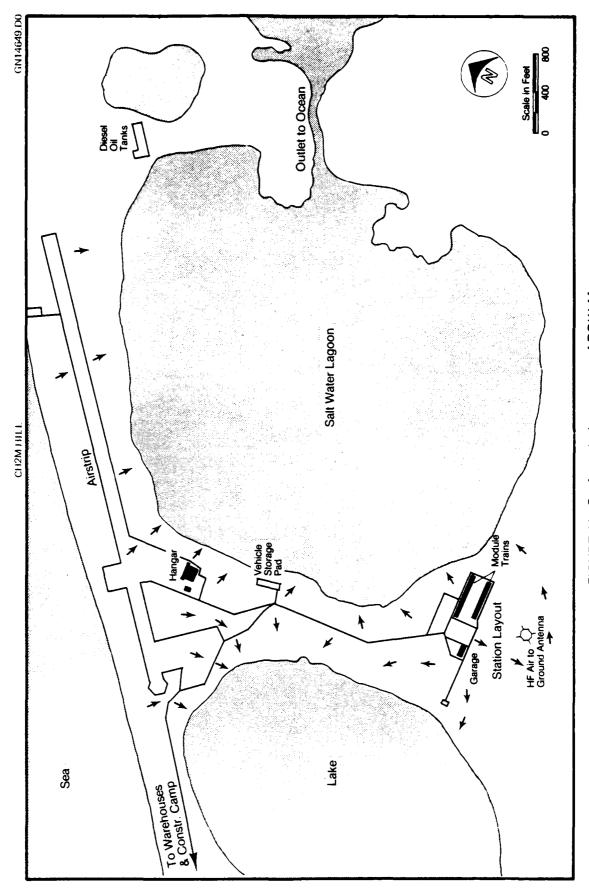
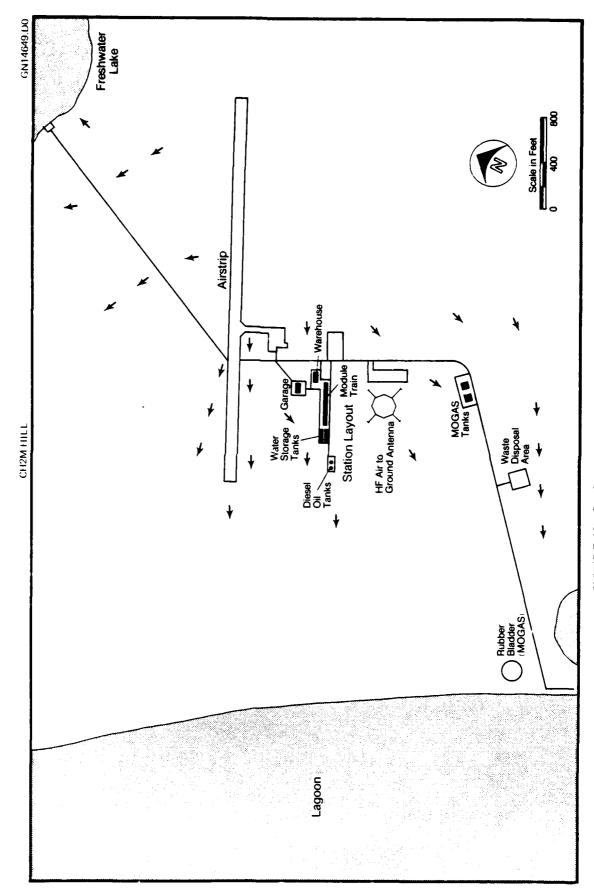


FIGURE 11. Surface drainage map of POW-M.



the second of the second secon

FIGURE 12. Surface drainage map of LIZ-3.

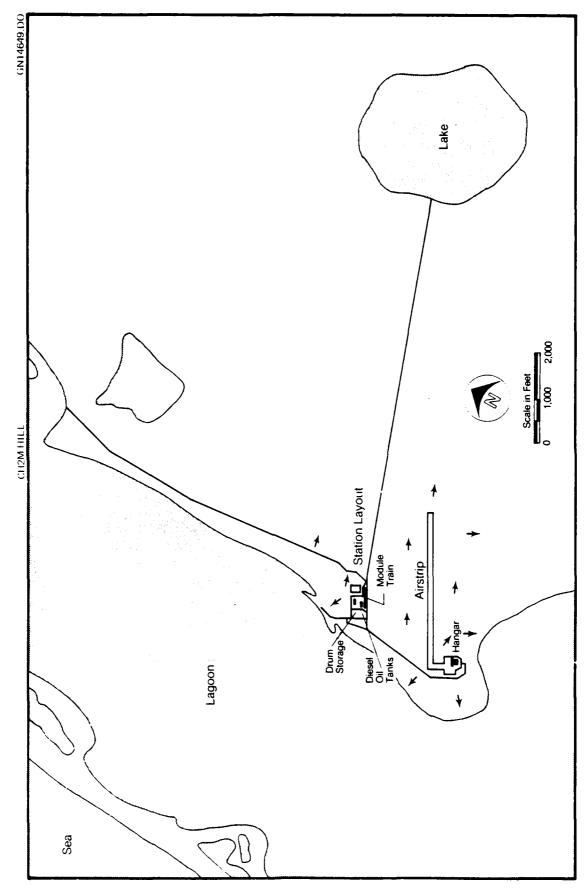


FIGURE 13. Surface drainage map of LIZ-2.

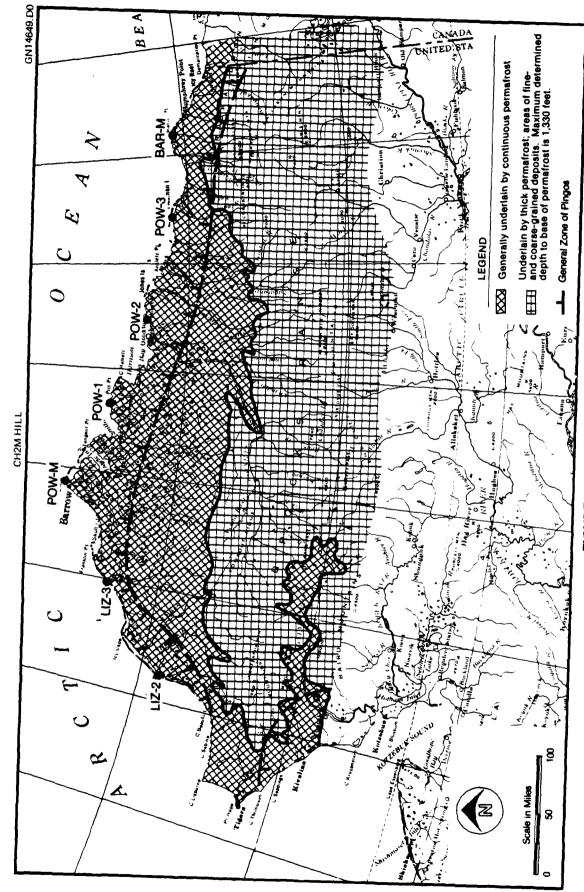


FIGURE 14. Permafrost map.

FIGURE 15. Location map of sites reviewed at BAR-M.

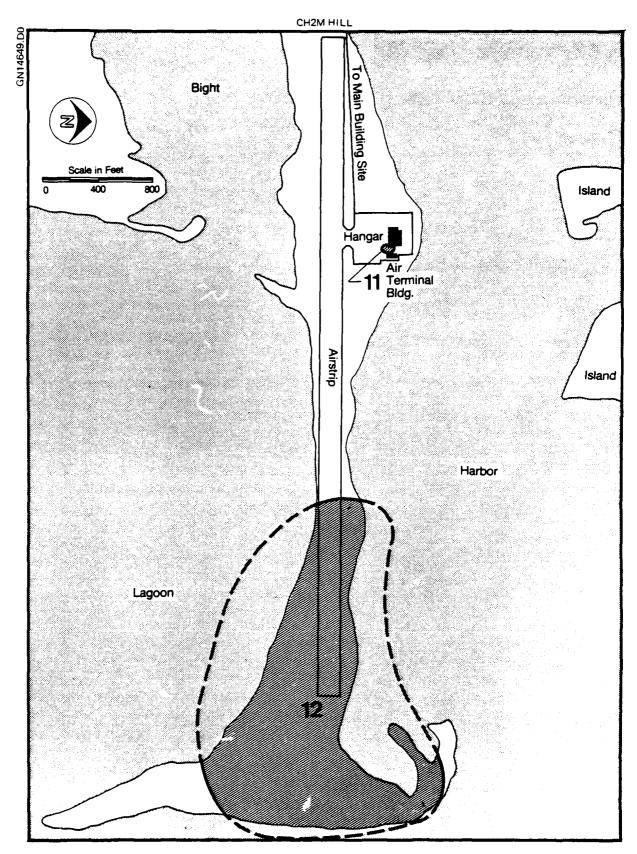


FIGURE 16. Location map of sites reviewed at BAR-M.

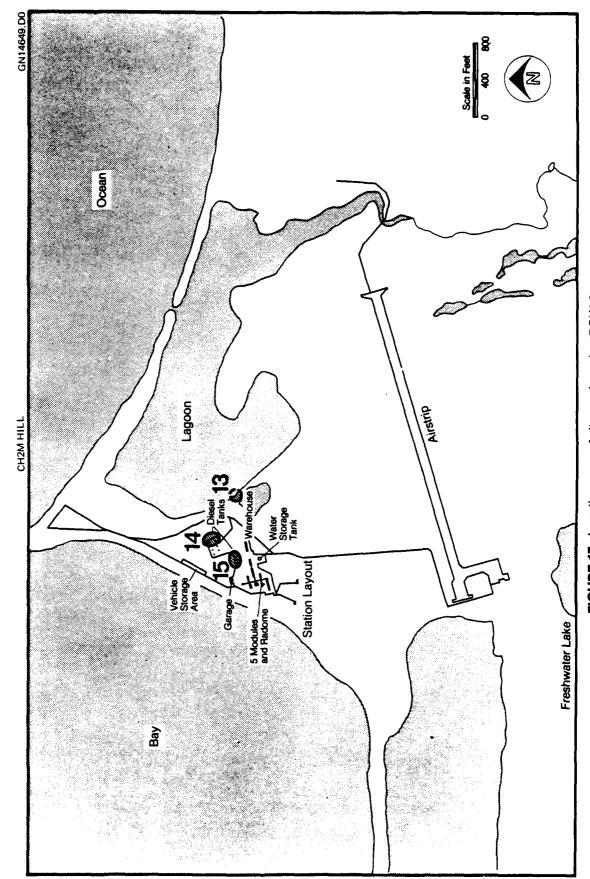


FIGURE 17. Location map of sites reviewed at POW-3.

FIGURE 18. Location map of sites reviewed at POW-2.

FIGURE 19. Location map of sites reviewed at POW-1.

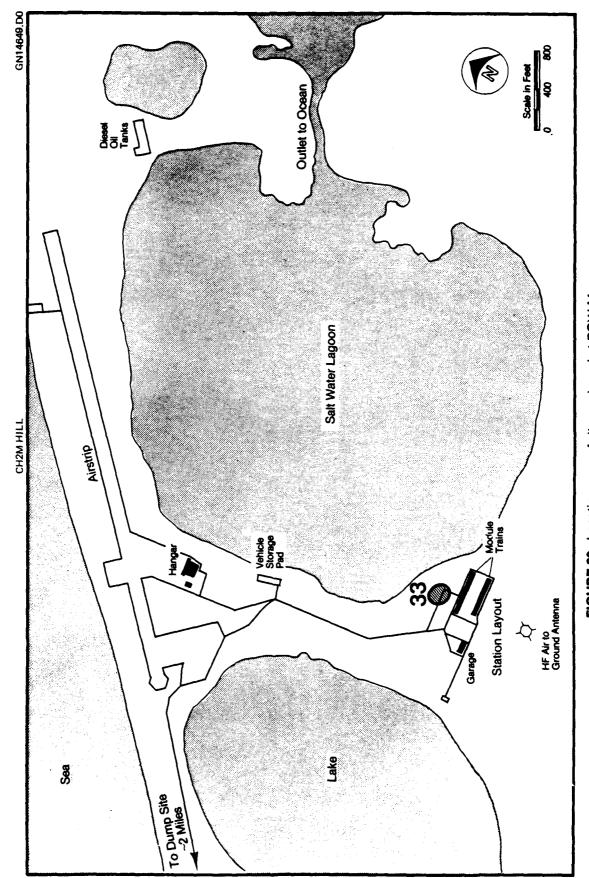


FIGURE 20. Location map of sites reviewed at POW-M.

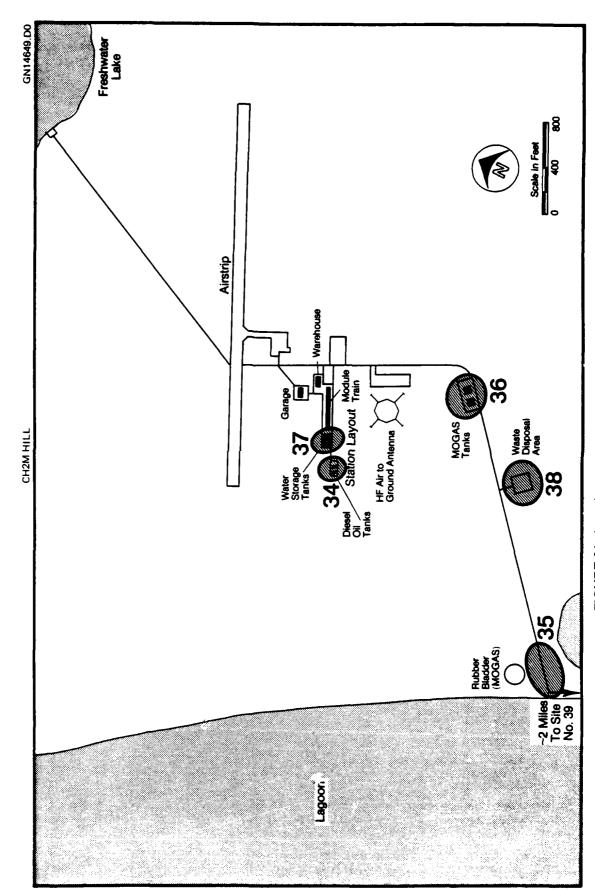


FIGURE 21. Location map of sites reviewed at LIZ-3.

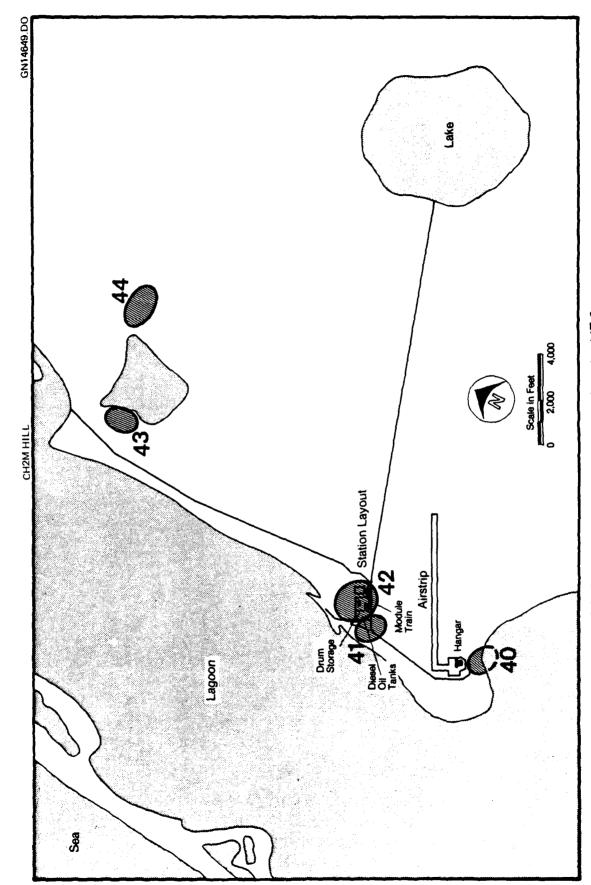


FIGURE 22. Location map of sites reviewed at LIZ-2.

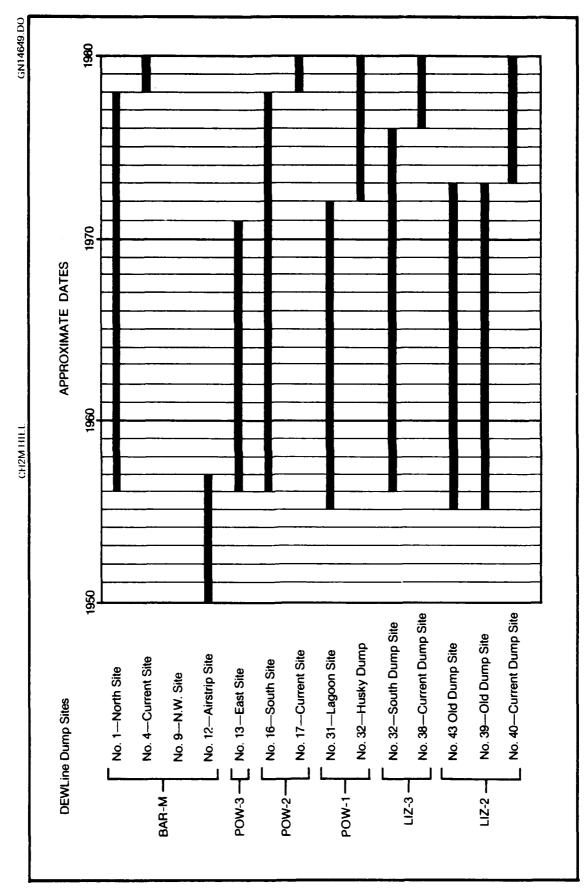


FIGURE 23. Historical summary of landfill activities on the Alaskan DEWLine.

Appendix A PHOTOGRAPHS

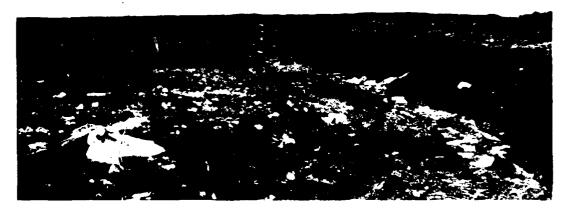


FIGURE A-1. Abandoned dump site cleaned up in 1979, BAR-M Site No. 1.



FIGURE A-2. Current dump site used by both BAR-M and village of Kaktovik : Site No. 4:.



FIGURE A-3. Flaxman Island, POW-3, looking south.



FIGURE A-4. Dump site at Flaxman Island, POW-3 (Site No. 13).

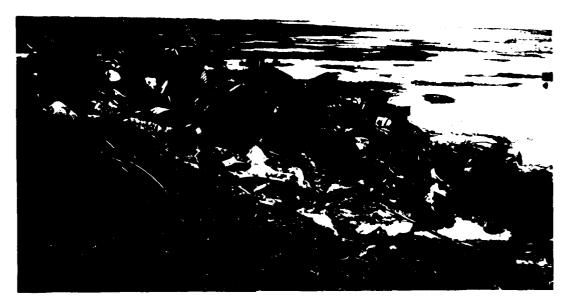


FIGURE A-5. Dump site at Husky Oil used by POW-1 (Site No. 32).



FIGURE A-6. Fuer-comaminated pond adjacent to fuel storage POW-1 (Site No. 28).



FIGURE A-7. Typical drum storage area, POW-1 (Site No. 26).

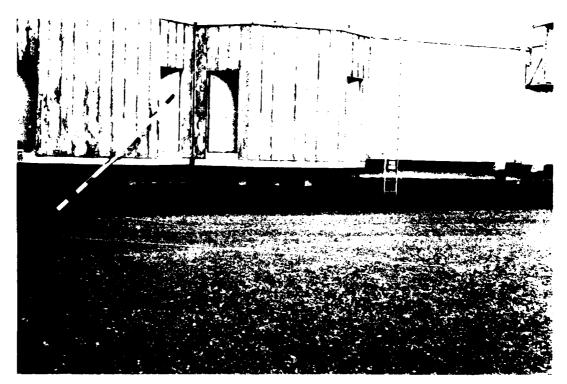


FIGURE A-8. LIZ-3 powerhouse fuel spill site (Site No. 37).

Appendix B RESUMES OF KEY TEAM MEMBERS

GARY E. EICHLER Hydrogeologist

Education

M.S., Engineering Geology, University of Florida, 1974 B.S., Construction and Geology, Utica College of Syracuse University, 1972

Experience

Mr. Eichler has been responsible for ground-water projects for both water supply and effluent disposal. Studies have included site selection, well design, construction services, monitoring and testing programs, determination of aquifer characteristics, and well field design. Examples of projects on which Mr. Eichler has worked include:

- Palm Coast, Florida. Conducted a test well program to determine available ground-water resources of a 250,000-person coastal development.
- Live Oak, Florida. Determination of geologic conditions at a pond failure site; identification of failure causes and recommendation for redesign of the facility compatible with site geology.
- Quaker Oats Company, Belle Glade, Florida. Test pumping and water quality sampling for an injection well facility; provided operational design criteria for the disposal system and determined aquifer characteristics.
- St. Augustine, Florida. Prepared a program of exploration and testing to locate a future supply of water; determined hydrogeologic conditions, located potential well sites, and initiated a test program.

Prior to joining CH2M HILL in 1976, Mr. Eichler was an engineering geologist with Environmental Science and Engineering, Inc., of Gainesville, Florida. Responsibilities there included project management, soils investigations, siting studies, ground-water and surface-water reports, and federal and state environmental impact studies. He has professional capabilities in the following areas.

- Hydrogeology. Water supply well location, aquifer testing, well field layout, injection well testing and monitoring program design, and well construction inspection.
- Water resources inventory. Potentiometric mapping, water yield, and availability determinations.

GARY E. EICHLER

- Site investigations. Determination of subsurface conditions, primarily in soil media. Determination of stratigraphic correlation and associated physical properties for engineering design.
- Environmental permitting. Federal, state, regional, and local permit studies associated with industrial and mining projects.
- Clay mineralogy. Clay mineral reactions primarily associated with lime stabilization for highways and other engineering projects. Participated in a Brazilian highway project and developed laboratory analysis for lime-soil reactions.
- Engineering geology. Geologic exploration, soil property determinations for engineering design, and water and earth materials interactions associated with construction.
- Geophysics. Well logging and interpretation.

Mr. Eichler directed the laboratory analysis of tropical soils to determine engineering properties and reaction potential with lime additives for a Brazilian highway project. He also assisted in the preparation and presentation of a seminar on lime stabilization sponsored by the National Lime Association.

Membership in Organizations

American Water Resources Association Association of Engineering Geologists Geological Society of America Southeastern Geological Society

Publications

Engineering Properties and Lime Stabilization of Tropically Weathered Soils. M.S. thesis, Department of Geology, University of Florida. August 1974.

BRIAN H. WINCHESTER : Ecologist

Education

B.S., Wildlife Ecology, University of Florida, 1973

Experience

Mr. Winchester's responsibilities at CH2M_HILL include project management, design and implementation of field sampling programs, data analysis and interpretation, impact assessment and prediction, environmental planning for impact mitigation, report preparation and review, and technical consulting at client-agency hearings. He has applied his expertise to numerous Environmental Impact Statements (EIS's), Developments of Regional Impact (DRI), and industry, power plant, and 208 studies.

- Trident Submarine Base EIS—Managed terrestrial and wetland biology subproject. Designed and directed quarterly field sampling and analyses for coastal sites in Rhode Island, Virginia, South Carolina, Georgia, and Florida. Prepared terrestrial and wetland portions of draft and final EIS.
- Gulf Intracoastal Waterway EIS—Conducted flora/fauna assessment of biota along the 300-mile Intracoastal Waterway in coastal Louisiana. Assessed impacts of maintenance dredging.
- California Lake Watershed EIS—Inventoried and mapped biotic communities for a 9-square-mile watershed in Dixie County, Florida. Assessed impacts of flood control channelization of major watercourses.
- Phosphate Industry DRI's—Managed or assisted in preparing five phosphate mine DRI's in central Florida. Helped develop mining and reclamation plans and provided technical input at client/agency hearings. Also provided biological baseline and impact assessment data for beneficiation plant sitings.
- Residential Development DRI's—Conducted biotic community inventories delineated wetlands, and prepared DRI's for three proposed residential developments in central and southern Florida.
- Wetlands Studies—Developed cost-effective, time-effective methodologyfor estimating the ecological value of freshwater wetlands and
 applied the technique to over 800 wetlands in central peninsular
 Florida. Assessed potential dredge and fill impacts on numerous
 wetlands.
- Transportation/Corridor Studies—Evaluated biological impacts associated with alternative routings of major new highways in Pinellas and Duval Counties, Florida. Assessed environmental impacts of upgrading a telephone communications corridor extending from Windermere to Tampa. Described biota and prepared a negative declaration for a proposed interstate highway interchange in Flagler County.

BRIAN H. WINCHESTER

- Power Plant Studies—Conducted study of aquatic biota entrained at a Miami generating station. Assessed impacts of blowdown on plant communities surrounding two Florida generating stations. Assisted in delineation of biotic communities for a generating station expansion in Crystal River, Florida. Prepared environmental assessments for siting power plants in western and north-eastern Washington.
- Industry Studies—Managed a 2-year biological monitoring program to assess potential impacts of industrial effluents in upper Escambia Bay. Conducted baseline terrestrial and aquatic quarterly sampling for a clean fuels facility to be located adjacent to an estuarine area in Jacksonville, Florida. Predicted SO₂ and NO_X air emission impacts on vegetation for a proposed caprolactam facility in southern Alabama. Contributed to preliminary biological inventories of limestone quarry and processing plantsites in central and coastal Alabama.
- 208 Studies—Mapped and assigned value classifications for all nonmarine wetlands in Pasco, Pinellas, Hillsborough, and Manatee Counties, Florida, for Tampa area 208.
- Rare and Endangered Biota Research—Managed and designed a research project on the ecology and management of a recently rediscovered endangered mammal. Conducted numerous endangered biota inventories.

Membership in Organizations

Ecological Society of America

Publications

"An Approach to Valuation of Florida Freshwater Wetlands." Proceedings of the Sixth Annual Conference on the Restoration and Creation of Wetlands, 1979 (with L. D. Harris).

The Current Status of the Colonial Pocket Gopher. Oriole 43:33-35. 1978 (with R. S. DeLotelle).

Ecology and Management of the Colonial Pocket Gopher: A Progress Report. *Proceedings of the Rare and Endangered Wildlife Symposium*, Athens, Georgia, 1978 (with R. S. DeLotelle, J. R. Newman, and J. T. McClave).

The Ecological Effects of Arsenic Emitted from Nonferrous Smelters. Final Report for U.S. EPA, Washington, D.C. (with Francis E. Benenati and Timothy P. King) February 1976.

BARBARA J. BRITT Engineering Aide

Education

Currently enrolled in pre-engineering program at Santa Fe Junior College, Gainesville, Florida High School Diploma, Santa Fe High School, Alachua, Florida, 1973

Experience

Ms. Britt's primary responsibilities with the firm involve geophysical logging of water wells. Logs have included resistance, gamma ray, temperature, fluid conductivity, caliper, and flowmeter. She has also worked with a motorized depth sampler. Other responsibilities include data reduction and analysis. Examples of her project-related experience include:

- Pumping test and data analysis for the City of St. Augustine, Florida.
- Geophysical logging for the City of Pompano, Florida.
- Hydrogeologic data reduction and analysis for the Orlando Utilities Commission, Orlando, Florida.
- Geophysical logging for the Miami-Dade Water and Sewer Authority deep-injection wells, to a depth of 3,000 feet in a limestone aquifer.

Before joining the Water Resources Department, Ms. Britt worked in the Word Processing Department as assistant supervisor.

Education

- M.S., Environmental Engineering, University of Southern California, 1977
- B.S., Structural Engineering, California State Polytechnic University, 1975
- B.S., Water Quality Engineering, California State Polytechnic University, 1975

Experience

Mr. Andress joined CH2M HILL in the Anchorage office in 1979. His primary responsibilities include providing project management and engineering support on a variety of projects within Alaska.

Examples of his project experience include the following:

- Structural design of the Ocean Cape dock and warehouse renovation at Yakutat.
- Design and construction management supervision of a viliage safe water facility at Akiachak. Total facility includes wood building, water and sewage treatment, laundry, showers, and honeybucket dump, soils investigations, water treatability studies; and water well drilling.
- Evaluation of water, sewer, and fuel oil utilities for three pump station camps for Alyeska Pipeline Service Company.
- Design of pipe supports for above-ground portion of water and sewer utilities at Barrow.
- Design of water intake structure for salmon hatchery in southwestern Alaska.
- Site investigation, review of water treatability studies for Eagle River water investigation for Municipality of Anchorage.
- Design of new water line to serve city dock for City of Homer.

Before joining CH2M HILL, Mr. Andress was employed as a structural engineer with Arctic Structures, Inc., Anchorage. His responsibilities included structural design of shop and camp facilities for the oil support industries at Prudhoe Bay. Previous experience at the Jet Propulsion Laboratory, Pasadena, California, included extensive research and development on activated carbon wastewater treatment and coal desulfurization by low temperature chlorinolysis projects.

GUS ANDRESS

Professional Engineering Registration

Alaska, California

Membership in Organizations

Alaska Water Management Association American Public Works Association California Water Pollution Control Association Water Pollution Control Federation

Publications

Preliminary Report: Activated Carbon Treatment System (ACTS) for the Treatment of Municipal Wastes. Jet Propulsion Laboratory, Pasadena, California, 1977

Coal Desulfurization by Low Temperature Chlorinolysis, Jet Propulsion Laboratory, Pasadena, California, 1978

Appendix C
OUTSIDE AGENCY CONTACTS

Appendix C OUTSIDE AGENCY CONTACTS

- Environmental Conservation Department, Northern Region, Fairbanks, Alaska 99701 Chuck Caraway, 907/452-1714
- Alascom, Fairbanks, Alaska 99701
 Dwayne Taylor, 211/Zenith-9000
- Fish and Wildlife, Arctic National Refuge,
 101 12th Avenue, Fairbanks, Alaska 99701
 Don Ross, 907/452-1951
- 4. University of Alaska, Geophysical Institute, College Road, Fairbanks, Alaska 99701 Richard Reger, 907/479-7496
- 5. University of Alaska, Institute of Arctic Biology, College Road, Fairbanks, Alaska 99701 Bob Bursdate, 907/479-7077 and Terry Chapin, 907/479-7153
- 6. University of Alaska, Cold Regions Research Engineering Lab, College Road, Fairbanks, Alaska 99701 Larry Johnson, 907/479-7637
- Department of Interior,
 Anchorage, Alaska 99501
 Lou Jers, 907/271-3632
- Arctic Environmental Information Data Center,
 707 A Street, Anchorage, Alaska 99501
 Larry Underwood, 907/279-4523
- 9. Department of Fish and Game, Mel Bucholtz, 907/452-1531

- 10. Husky Oil, Anchorage, Alaska 99501 John Schindler, 907/279-4566
- 11. U.S. Geological Survey,
 218 E Street, Anchorage, Alaska 99501
 Max Brewer, 907/276-4566
- 12. EPA, Alaska Operations Office,
 701 C Street, Anchorage, Alaska 99501
 Bill La Mororeaux. 907/271-5083
- 13. Department of Environmental Conservation, Juneau, Alaska 99801 Al Boggs, 907/465-2666
- 14. U.S. Fish and Wildlife Service,
 1011 East Tudor Street, Anchorage, Alaska 99501
 Howard Metsker, 907/263-3510

Appendix D HISTORY OF THE DEW LINE In 1952, it became apparent that the possibility of destructive airborne attacks by potential enemies placed the United States and Canada in critical jeopardy. At that time, a jet aircraft could easily place our major cities within the perimeter of its A-bomb cargo before giving adequate warning of its ultimate mission.

Faced with that possibility, the military community formed a research team of handpicked scientists (code name "Summer Study Group") to solve the problem. The invention, installation, and maintenance of a distant early warning radar and communication system, positioned as close as possible to the threatening enemy air bases, was the scientists' recommendation accepted by the Air Force.

The research team, assembled at Massachusetts Institute of Technology, Lincoln Laboratories, immediately set out in the summer and fall of 1952, inventing radar and radio equipment with its associated electronic systems that could survive an environment of -60°F in winter, electric storms in the summer, fluctuating currents of the North Magnetic Pole, and the strange phenomenon of northern lights. The first test equipment was airlifted by the Air Force to Barter Island, 240 miles north of the Arctic Circle, to set up the first DEW (Distant Early Warning) Line outpost.

During the experiments, the scientists modified, designed, and changed the equipment until the team was satisfied that they had reached a feasible and practical approach to technical problems on the DEW Line.

A training center at Streator, Illinois, was developed complete with boxlike structures of the DEW Line station and the radome to simulate actual line conditions. The training center proved adequate until 1963, when it became necessary to expand in order to adjust to the added load of the Greenland sites.

In December 1952, the Defense Department took action as a result of the Summer Study Group's accomplishments and gave approval of the DEW System Defense Plan, Project 572. It was decided that the initial effort would be tested in Alaska, because two-thirds of the original proposed DEW Line would be in Canada. It was felt that we could gain time and know-how in Alaska on our own land.

The Bell System Western Electric Company became the primary contractor, with responsibility for engineering, construction, installation, and initial operation of the chain of radar and communication systems on Alaska's north coast. The schedule called for having these stations fully operational within 1 year.

The construction of the Alaska segment was a first-time event for almost every phase of the job. Construction and survival problems were a constant threat. Fortunately, many of these problems had been met and solved by the Navy, which set up a World War II camp at the northernmost point of the continent, Point Barrow, Alaska.

This camp provided working headquarters for the DEW Line project. In its heated hangar, the first of 18 modules were assembled to be placed on sled-like transports to be located at 50-mile intervals from Cape Lisburne in the west, to the Canadian border in the east.

Three types of stations were constructed: (1) the Main station consisting of approximately two 25-module building trains bridged together, equipped with rotating radar and warehouse facilities for garages, shops, etc., to provide full service and logistics support for its sector; (2) the Auxiliary station consisting of one 25-module train, equipped with rotating radar and self-support facilities; and (3) the Intermediate station consisting of a single 5-module train and essential support facilities. The "I" sites were not equipped with rotating radar; they served as anchor points for doppler type radar fences between Main and Auxiliary stations.

The Alaska Experimental Line went into operation in 1953 and proved by experience the practicality of stretching the DEW Line across the remaining 2,000 miles to the east coast of Canada at Cape Dyer.

In 1957 the original DEW Line was turned over to a civilian contractor for operation and maintenance. Until 1963, when the 28 intermediate sites were deactivated, there were 61 sites whose prime mission was radar surveillance and initiation of early warnings. In addition, the contractor was responsible for operation of three communication relay stations rearward of the DEW Line.

The original DEW Line was administratively subdivided into six sectors, each approximately 500 miles long. To maintain security, the sectors were referred to by symbols that were derived from geographical names such as: DYE for Cape Dye, BAR from Barter Island, etc. Intermediate stations on the DEW Line had alphabetic designations; BAR-A, BAR-B, etc.; the main stations had an M (Main station) following the sector name, and the auxiliary stations had a numerical designation, i.e., BAR-1, BAR-2, etc. The sector name establishes the name of the sites east of it to the next

Main station.

Since establishment of the upgraded role in military long-haul communications network, the DEW Line is now considered the DEW System. Today, the DEW Systems Office contributes to the overall TAC/NORAD air defense mission by monitoring the USAF contractor-operated radar/communications network. Currently the DEW Line consists of 31 sites, divided into five sectors, each having one main station and various numbers of auxiliary stations. Table D-1 lists the stations currently controlled by DSO.

The DEW Line still maintains its original mission of distant early warning and a communications network across the north coast of North America.

Table D-1 DEW LINE STATION LIST

Station	Geographical Name
LIZ-2	Point Lay, Alaska
LIZ-3	Wainwright, Alaska
POW-M	Point Barrow, Alaska
	Lonely, Alaska
POW-2	Oliktok, Alaska
POW-3ª	Bullen Point (Flaxman Island)
BAR-M	Barter Island, Alaska
BAR-1	Komakuk Beach, Canada
BAR-2	Shingle Point, Canada
BAR-3	Tuktoyaktuk, Canada
BAR-4	Nicholson Peninsula, Canada
PIN-M	Cape Parry, Canada
PIN-1	Clinton Point, Canada
PIN-2	Cape Young, Canada
PIN-3	Lady Franklin Point, Canada
PIN-4	Byron Bay, Canada
CAM-M	Cambridge Bay, Canada
CAM-1	Jenny Lind Island, Canada
CAM-2	Gladman Point, Canada
CAM-3	Shepherd Bay, Canada
CAM-4	Pelly Bay, Canada
CAM-5	Mackar Inlet, Canada
FOX-M	Hall Beach, Canada
FOX-2	Longstaff Bluff, Canada
FOX-3	Dewar Lakes, Canada
FOX-4	Cape Hooper, Canada
FOX-5	Broughton Island, Canada
DYE-M	Cape Dyer, Canada
DYE-1	Qaqatoqaq, Greenland
DYE-2	Westerly Ice Cap, Greenland
DYE-3	Easterly Ice Cap, Greenland
DYE-4	Kulusuk, Greenland
DYE-5	KeFlavik, Iceland

^aNo longer active.

Appendix E SITE HAZARD EVALUATION METHODOLOGY

HQ AIR FORCE ENGINEERING AND SERVICES CENTER AND USAF OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY

SITE RATING METHODOLOGY

FOR

PHASE I
INSTALLATION RESTORATION PROGRAM

SITE RATING METHODOLOGY FOR

PHASE I INSTALLATION RESTORATION PROGRAM

- 1. This site rating methodology for Phase I of the Installation Restoration Program (IRP) has been jointly developed by CH₂M Hill and Engineering-Science based on experience in performing Record Searches at several Air Force installations. This standard site rating system should be used for all Air Force IRP Records Search efforts to assist in Air Force prioritization and commitment of resources for Phase II survey actions.
- 2. The basis for the rating system is the document developed by JRB Associates, Inc. for the EPA Hazardous Waste Enforcement office. The JRB system was modified to accurately address specific Air Force installation conditions and to provide meaningful comparison of landfills and contaminated areas other than landfills.
- 3. Questions pertaining to use of the Air Force Site Rating Methodology should be addressed to either Mr. Lindenberg, AFESC/DEVP, AUTOVON 970-6189 (Commercial (904) 283-6189) or Major Fishburn, AF OEHL/EC, AUTOVON 240-3305 (Commercial (512) 536-3305).

Note: Both CH₂M Hill and Engineering-Science are Engineering Support contractors for the US Air Force.

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Site		_
Location		
Owner/Operator		
Comments		

	PACTOR HALL RATING PACTOR POES	MIN Tale
RATING PACTOR	(0-3) MULTIPLIER SCORE SCO	
RECEPTORS		
Population Within	······································	
1,000 Feet	4	
Distance to Nearest		
Drinking Water Hell	15	
Distance to Reservation Roundary	•	
Land Use/Zoning	3	
Critical Environments	. 12	
Water Quality of Hearby Surface Water Body	•	
Number of Assumed Values = Cut of 6	SUPTOTALS	_
Percentage of Assumed Values =\	SUBSCORE (Factor Score Divided by Maximum	—
Percentage of Missing Valuest	Score and Multiplied by 100)	
PATHIQITS		
		_
Pridence of Water Contemination	10	
level of Water Contemination	15	
		_
Type of Contamination, Soil/Biota	5	_
Distance to Hearest Surface Water	4	
Analis de Company	7	_
Septh to Groundweier	<u>'</u>	_
Net Presipitation	6	
loil Permeshility	6	_
on remainty	· • • • • • • • • • • • • • • • • • • •	
Dedrock Permeability	4	
Depth to Sedrock	4	_
	·	_
Rirface Erosion	4	
Number of Assumed Values Out of 10	SUSTOTALS	_
Percentage of Assumed Values = 1	SURSCORE	_
Number of Missing Values Out of 10	(Pactor Score Divided by Maximum	
Persontage of Missing Values =	Score and Multiplied by 1001	
		_

WASTE CHARACTERISTICS

stardous Reti	ing: Judgemental rating from 30 to 100 points based on the following guidelines:
oiate	
30	Classi demostis-type landfill, old site, so known hexardous vestes
40	Closed demostic-type landfill, recent sits, no known hazardous wastes
50	Susperted small quantities of hexardons westes .
60	Room small quantities of hazerdone vestes
70	Ausported mederate quantities of hesardous wastes
80	Enorm underste quantitos of hazardous wastes
90	Suspected large quantities of hesardous wastes
100	Rnown large quantities of bazardous wastes
	\$UBSCORE
housen for i	Acaigned Mazardous Pating:

WASTE HAMAGEMENT PRACTICES

RATING PACTOR	PACTOR BATING (0-3)	HULSTPLIER	FACTOR SCORE	MAKENUM PORSIBLE SCORE
Record Accuracy and Ease of Access to Size		7	 	
Recordons Mayte Quantity		7		
Total Maste Quantity		4		
Weste Incompatibility		3		
Absence of Liners or Confixing Bods		6		
Use of Leachsta Callection System		6		
Use of Gas Cellection Systems		2		
Site Cleaure				
Subsections Flows		7		
Percentage of Missing and Mon-Applicable Values - Out of 9 Percentage of Missing and Mon-Applicable Values - Out of 9 Percentage of Missing and Mon-Applicable Values - 1		SUSTOTALS SUBSCORE (Factor Score Score and Mult		
Overall Number of Assumed Values = Out of 25		•		
Overall Percentage of Assumed Values *		Subscore X 0.22 wherere X 0.30 p		

Pathweys Subscore X 0.30 plus Waste Characteristics Subscore X 0.24 plus Waste Management Subscore X 0.24)

		RATING FACTOR SYSTEM GUIDELINES	GUIDELINES	
		RECEPTORS		
		Raj	Rating Scale Levels	
Rating Factors	0		2	3
Population within 1,000 Feet	0	1 to 25	26 to 100	Greater than 100
Distance to Nearest Drinking Water Well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet
Distance to Reservation Boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet
Land Use/Zoning	Completely remote (zoning not applicable)	Agricultural	Commercial or industrial	Residential
Critical Environments	Not a critical environment	Pristine natural areas	Wetlands; flood plains, and preserved areas; presence of economically important natural resources	Major habitat of an endangered or threatened species; presence of recharge area
Water Quality Designation of Nearest Surface-Water Body	Agricultural or industrial use	Recreation, propagation and management of fish and wildlife	Shellfish propagation and harvesting	Potable water supplies
		PATHWAYS		
Evidence of Water Contamination	No contamination	Indirect evidence	Positive proof from direct observation	Positive proof from laboratory analyses
Level of Water Contamination	No contamination	Low levels, trace levels, or levels less than maximum contaminant level (MCL) or EPA drinking water standards	Moderate levels or levels near MCL or EPA drinking water standards	High levels greater than MCL or EPA drinking water standards
Type of Contamination Soil/Biota	No contamination	Suspected contamination	Moderate contamination	Severe contamination
Distance to Nearest Surface Water	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet
Depth to Ground Water	Greater than 500 feet	51 to 500 feet	11 to 50 feet	0 to 10 feet
Net Precipitation	Less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches
Soil Permeability	Greater than 50% clay (<10 ⁻⁶ cm/s)	30% to 50% clay (10°4 to 10°6 cm/s)	15% to 30% clay (10 ⁻² to 10 ⁻⁴ cm/s)	0% to 15% clay (>10°2 cm/s)
Bedrock Permeability	Impermeable (<10°6 cm/s)	Relatively impermeable (10 ⁻⁴ to 10 ⁻⁶ cm/s)	Relatively impermeable (10°2 to 10°4 cm/s)	Very permeable (>10 ⁻² cm/s)
Depth to Bedrock	Greater than 60 feet	31 to 60 feet	11 to 30 feet	0 to 10 feet
Surface Erosion	None	Slight	Moderate	Severe

		WASTE CHARACTERISTICS		
Judgemental hazardous ratin	Judgemental hazardous rating from 30 to 100 points based on the following guidelines:	llowing guidelines:		
Points	Condition	tion		
30	Closed domestic type landfill, old site, no known hazardous wastes	no known hazardous wastes		
40	Closed domestic-type landfill, recent site, no known hazardous wastes	te, no known hazardous wastes		
8	Suspected small quantities of hazardous wastes	is wastes		
99	Known small quantities of hazardous wastes	Vastes		
70	Suspected moderate quantities of hazardous wastes	rdous wastes		
8	Known moderate quantities of hazardous wastes	ous wastes		-
8	Suspected large quantities of hazardous wastes	s wastes		
001	Known large quantities of hazardous wastes	astes		
	WAS	WASTE MANAGEMENT PRACTICES		
		Rating Scale Levels	S) 0	
Rating Factors	0	_	2	3
Record Accuracy and Ease of Access to Site	Accurate records, no unauthorized dumping	Accurate records, no barriers	Incomplete records, no barriers	No records, no barriers
Hazardous Waste Quantity	<1 ton	1 to 5 tons	5 to 20 tons	>20 tons
Total Waste Quantity	O to 10 acre feet	11 to 100 acre feet	101 to 250 acre feet	Greater than 250 acre feet
Waste Incompatibility	No incompatible wastes are present	Present, but does not pose a hazard	Present and may pose a future hazard	Present and posing an immediate hazard
Absence of Liners or Confining Strate	Liner and confining strata	Liner or confine g strata	Low quality liner or low permeability strata	No liner, no confining strata
Use of Leachate Collection Systems	Adequate collection and treatment	Inadequate collection or treatment	Inadequate collection and treatment	No collection or treatment
Use of Gas Collection Systems	Adequate collection and treatment	Collection and controlled flaring	Venting or inadequate treatment	No collection or treatment
Site Closure	impermeable cover	Low permeability cover	Permeable cover	Abandoned site, no cover
Subsurface Flows	Bottom of landfill greater than 5 feet above high ground-water level	Bottom of landfill occasionally submerged	Bottom of fill frequently submerged	Bottom of fill located below mean ground-water level

JRB RATING SYSTEM INTRODUCTION AND METHODOLOGY

Source: "Methodology for Rating the Hazard Potential

of Waste Disposal Sites" JRB Associates, Inc.,

December 15, 1980

Note: This is an excerpt from the above-referenced

document. For more detailed information refer

to that source.

CHAPTER 1.0 INTRODUCTION

As part of EPA's nationwide waste management program, land disposal facilities containing hazardous wastes will be investigated and evaluated. Remedial action plans will be formulated for those sites presenting a significant hazard. Because resources for this task are limited, the initial focus of the work must be on the most hazardous sites. Under the auspices of EPA's Office of Enforcement, JRB Associates has devised a methodology for selecting sites for investigation based on their high potential for environmental impact.

This methodology has several advantages over other rating systems:

- . It is easy to use
- It does not require users to have an extensive technical background
- It uses readily available information
- It does not require complex chemical or hydrological analyses
- It does not require users to visit the facilities in question
- It allows sites to be rated even if some data needs cannot be met.

The system consists of 31 rating factors that are divided into 4 categories: receptors; pathways; waste characteristics; and waste management practices. Factors in the receptors category determine the prime targets of environmental contamination. Factors in the pathways category assess mechanisms for contaminant migration. Factors in the waste characteristics category examine the types of hazards posed by contaminants in the site. Factors in the waste management practices category evaluate the quality of the facility's design and operation. Each rating factor has an associated four-level scale. Because all of these factors are not of equal importance, each also has been assigned a weighing factor, called a multiplier. Raters must simply decide

which level of the rating factor's scale is most appropriate for a given site and multiply the numeric value of that level by the corresponding multiplier. The sum of the products for the 31 factors divided by the maximum possible score and multiplied by 100 is the site's rating. The ratings are on a scale of 0 to 100 and can be interpreted in relative or absolute terms.

Users can assign additional points when the rating factors do not adequately address all of the problems of a site. However, only a limited number of additional points can be assigned. This arrangement helps to ensure that a site's rating is both complete and objective.

The methodology has been designed primarily for landfills, surface impoundments, and other types of land-based storage and disposal facilities. Incinerators and waste treatment facilities, however, are beyond scope with the exception of the solid wastes produced by them.

Site ratings should be performed as part of an overall investigation procedure. Prior to a site visit, ratings can be based on published materials, public and private records, and contacts with knowledgable parties. The results of this type of rating can be used to determine which sites present the greatest potential hazard and should be visited first. A final rating can be obtained with information obtained from a visit to a site. This rating can be used as a tool to help determine how limited resources should be spent for additional sampling, which may be required to fill data gaps, and for preparing remedial action plans and/or enforcement cases for sites that represent particularly severe hazards.

The methodology's validity has been tested at sites across the country. This testing includes comparing ratings completed for the same facilities both by different raters, and before and after site visits. Officials of New Jersey's Department of Environmental Protection agreed that the ratings on 30 sites in their state were good reflections of the true hazard potential of those sites. These results show that the methodology is an exceptionally useful and efficient tool for classifying and ranking the hazard potential of land disposal facilities.

The methodology is discussed in more detail in the following four chapters. Chapter 2 describes the six basic components of the methodology. Chapter 3 identifies sources of information for the system and describes how to resolve data gaps. Chapter 4 presents the step-by-step procedure for rating sites, and Chapter 5 discusses how site ratings can be used. The three appendices provide guidance for rating sites. Finally, the glossary located at the end of this document defines all terms related to the methodology.

CHAPTER 2.0 DESCRIPTION OF THE METHODOLOGY

The site rating methodology has been developed in terms of six elements. These are:

- Factor categories
- e Rating factors
- · Rating scales
- Multipliers
- Additional points
- · Hazard potential scores.

These elements are described below.

2.1 FACTOR CATEGORIES

In assessing the environmental impacts of any hazardous waste disposal site, four considerations must be addressed. These are:

- Receptors
- Pathways
- Waste characteristics
- · Waste management practices.

Receptors refer to the biota (human and non-human) which are potentially affected by the materials released from a waste disposal site. Within this category, special attention is given to human populations and critical environments. Pathways refer to aspects of the routes by which hazardous materials can escape from a given site. The focus of this category is on the ease of migration of water soluble pollutants and on contamination due to the site. Waste characteristics refer to the types of hazards posed by materials in the facility in terms of both their health-related effects and their environmental mobility. Waste management practices refer to the design characteristics and management practices of a given disposal site as they

relate to the site's environmental impact. In particular, this category examines measures that are being taken to minimize exposure to hazardous wastes.

The prime importance of the factor categories is in partitioning the rating factors into manageable groups so that site ratings can be more easily and completely interpreted. This topic is discussed in greater detail in Chapter 5.

2.2 RATING FACTORS

The initial rating of a waste disposal facility is based on a set of 31 rating factors. Each of these has been assigned to one of the four factor categories. The receptors category has five rating factors:

- "Residential population within 1,000 feet" and "Distance to the nearest off-site building" measure the potential for human exposure to the site
- "Distance to the nearest drinking-water well" measures the potential for human ingestion of contaminants should underlying aquifers be polluted
- "Land use/zoning" evaluates the current and anticipated uses of the surrounding area
- "Critical environments" assesses the potential for adversely affecting important biological resources and fragile natural settings.

The pathways category contains nine rating factors concerned with the potential migration and attenuation of contaminants. The primary focus is on waterborne pollutants, since they can affect the greatest number of people.

- "Distance to the nearest surface water" and "Depth to groundwater" measure the availability of pollutant migration routes
- "Soil permeability," "bedrock permeability," and "depth to bedrock" measure the potential for contaminant attenuation and ease of migration

- "Net precipitation" uses annual precipitation and evapotranspiration to estimate the amount of leachate a site produces
- "Evidence of contamination," "type of contamination," and "level of contamination" evaluate pollution currently apparent at the site.

The waste characteristics category contains rating factors which examine the waste's environmental mobility and the adverse effects it can cause.

- "Solubility," "volatility," and "physical state" measure the extent to which mobile wastes can leave the site
- "Toxicity," "radioactivity," and "persistence" assess the site's potential to cause health-related injuries
- "Ignitability," "reactivity," and "corrosiveness" evaluate the possibility of fire, explosion, or similar emergencies.

The waste management practices factor category evaluates site design and operation. This category includes eight rating factors:

- "Use of leachate collection systems," "use of gas collection systems," and "use of liners" examine features of site design for containing contamination
- "Site security" assesses the measures taken to limit site
- "Total waste quantity" and "hazardous waste quantity"
 measure the quantity of waste in the site, and thus, the potential magnitude of resulting contamination
- "Waste incompatibility" evaluates the potential for incompatible wastes to combine and pose a hazard
- "Use of containers" assesses the adequacy of using containers to isolate wastes.

These factors have been selected because they are relevant to an evaluation of any land-based disposal facility. The definition and purpose of each rating factor appear in Appendix A.

2.3 RATING SCALES

For each of the factors, a four-level rating scale has been developed which provides factor-specific levels ranging from "0" (indicating no potential hazard) to "3" (indicating a high potential hazard). The rating factors and their corresponding rating scales for each of the factor categories are listed in Table 1. These scales have been defined so that the rating factors typically can be evaluated on the basis of readily available information from published materials, public and private records, contacts with knowledgeable parties, or site visits. Raters compare the information collected for a site with the limits set in the scales, and see which level of each scale most closely fits the information. The numeric value of that level is the factor rating for that factor. This process is described in more detail in Chapter 4. Additional guidance for assessing the rating scales appears in Appendix A.

2.4 MULTIPLIERS

The rating factors do not all assess the same magnitude of potential environmental impact. Consequently, a numerical value called a multiplier has been assigned to each factor in accordance with the relative magnitude of impact that it ices assess. These values are multiplied, hence the term multiplier, by the appropriate factor ratings (see Section 2.3) to result in factor scores for each of the rating factors. The 31 multipliers appear as the third column from the right on the methodology's two-page Rating Form (see Figure 3).

2.5 ADDITIONAL POINTS

Special features of a facility's location, design, or operation are frequently encountered that cannot be handled satisfactorily by rating factors alone. These features might present hazards that are unusually serious, unique to the site, or not assessable by rating scales. For example, an extremely high population density near a site should be considered even more hazardous than the rating factor for "population within 1,000 feet" indicates.

Power lines running through sites containing explosive or flammable wastes, though not generally typical of waste disposal sites, should be considered a potential hazard. Finally, the function of the nearest off-site building might indicate a serious threat of human exposure exists, even though types of functions cannot be quantitatively evaluated by rating scales the way distance can be. In such cases, raters should assign a greater hazard potential score to a site than it might otherwise receive by using the additional points system. To guide raters as to the types of situations that might warrant additional points, several examples have been identified for each of the factor categories. These are:

RECEPTORS

- Use of site by local residents
- · Neighboring land use
- Neighboring transportation routes, drinking water supplies, and important natural resources.

PATHWAYS

- Extreme runoff and erosion problems
- · Slope instability
- Flooding
- Seismic activity.

WASTE CHARACTERISTICS

- Carcinogenicity, mutagenicity, and teratogenicity
- Infectiousness
- Low biodegradability
- · High-level radioactivity.

WASTE MANAGEMENT PRACTICES

- Excessively large waste quantities
- Open burning of wastes
- · Site abandonment
- Unsafe disposal practices
- Inadequate cover
- Inadequate safety precautions
- · Inadequate recordkeeping.

Table 1. Rating Factors and Scales for Each of the Four Factor Categories (Continued)

RATING FACTORS	RATING SCALE LEVELS				
RATING PACIONS	0	. 1	2	3	
		RECEPTO	RS		
POPULATION WITHIN 1,000 FEET	0	1 TO 25	25 TO 100	GREATER THAN 100	
DISTANCE TO NEAREST DRINKING-WATER WELL	GREATER THAN 3 MILES	1 TO 3 MILES	3.001 FEET TO 1 MILE	0 TO 3,000 FEET	
DISTANCE TO NEAREST OFF-SITE BUILDING	GREATER THAN 2 MILES	1 TO 2 MILES	1,001 FEET TO 1 MILE	0 TO 1,000 FEET	
LANO USE/ZONING	COMPLETELY REMOTE (ZONING NOT APPL)- CABLE)	AGRICULTURAL	COMMERCIAL OR INOUSTRIAL	RESIDENTIAL	
Critical environments	NOT A CRITICAL ENVIRONMENT	PRISTINE NATURAL AREAS	WETLANDS, FLOOD- PLAINS, AND PRE- SERVED AREAS	MAJOR HABITAT OF AN ENDANGERED OR THREATENED SPECIES	
		PATHWAYS			
EVIDENCE OF CONTAMINATION	NO CONTAMINATION	INDIRECT EVIDENCE	POSITIVE PROOF FROM DIRECT OBSERVATION	POSITIVE PROOF PROW	
LEVEL OF CONTAMINATION	NO CONTAMINATION	LOW LEVELS, TRACE LEVELS, OR UNKNOWN LEVELS	MODERATE LEVELS OR LEVELS THAT CANNOT BE SENSED DURING A SITE VISIT BUT WHICH CAN BE CONFIRMED BY A LABORATORY ANALYSIS	HIGH LEVELS OR LEVELS THAT CAN BE SENSED EASILY BY INVESTIGATORS DURING A SITE VISIT	
TYPE OF CONTAMINATION	NO CONTAMINATION	SQIL CONTAMINATION ONLY	SIGTA CONTAMINATION	AIR, WATER, OR FOOD- STUFF CONTAM-NATION	
DISTANCE TO NEAREST SURFACE WATER	GREATER THAN 5 MILES	1 TO 5 MILES	1,001 FEET TO 1 MILE	0 TO 1.000 FEET	
DEPTH TO GROUNDWATER	GREATER THAN	51 TO 100 FEET	21 TO 50 FEET	0 TO 20 FEET	
NET PRECIPITATION	LESS THAN -10 INCHES	-10 TO -5 INCHES	-5 TO -20 INCHES	GREATER THAIL -20 INCHES	
SOIL PERMEABILITY	GREATER THAN 50% CLAY	30% TO 50% CLAY	15% TO 30% CLAY	0 TO 15% CLAY	
BEDROCK PERMEABILITY	IMPERMEABLE	RELATIVELY IMPERMEABLE	RELATIVELY PERMEAGLE	VERY PERMEABLE	
DEPTH TO BEDROCK	GREATER THAN	31 TO 60 FEET	11 TO 30 FEET	0 TO 10 FEET	

RATING FACTORS	<u> </u>	RATING SCAL	E LEVELS	·
OWING LACIOUS	0	1	2	3
	W	ASTE CHARACTERIST	ics	
TOXICITY	SAX'S LEVEL 0 OR NPPA'S LEVEL 0	Sax's Level 1 or NFPA's Level 1	SAX'S LEVEL 2 OR NFPA'S LEVEL 2	SAX'S LEVEL 3 OR NFPA'S LEVELS 3 OR 4
RADIOACTIVITY	AT OR BELOW BACK- GROUND LEVELS	1 TO 3 TIMES BACK- GROUND LEVELS	3 TO 5 TIMES BACK- GROUND LEVELS	OVER 5 TIMES BACK- GROUND LEVELS
PERSISTENCE	EASILY BIODEGRAD- ABLE COMPOUNDS	STRAIGHT CHAIN HYDROCAREONS	SUBSTITUTED AND OTHER RING COM- POUNDS	METALS, POLYCYCLIC COMPOUNDS, AND HALOGENATED HYDROCARBONS
IGNITABILITY	FLASH POINT GREATER THAN 200 ⁹ OR NFPA'S LEVEL 0	FLASH POINT OF 140°F, to 200°F, OR NFPA'S LEVEL 1	FLASH POINT OF 80°F, TO 140°F, OR NFPA'S LEVEL 2	FLASH POINT LESS THAN 80°F, OR NFPA'S LEVELS 3 OR 4
REACTIVITY	NFPA'S LEVEL 0	NFPA'S LEVEL 1	NFPA'S LEVEL 2	NFPA'S LEVELS 3 OR 4
CORROSIVENESS	pM OF 6 TO 9	pH OF 5 TO 6 OR 9 TO 10	pM OF 3 TO 5 OR 10 TO 12	aM OF 1 TO 3 OR 12 TO 14
SOLUBILITY	INSOLUBLE	SLIGHTLY SOLUBLE	SOLUBLE	VERY SOLUBLE
VOLATIUTY	VAPOR PRESSURE LESS THAN 0.1 mm Hg	VAPOR PRESSURE OF 0.1 TO 25 mm Hg	VAPOR PRESSURE OF 78 TO 25 mm Hg	VAPOR PRESSURE GREATER THAN 78 mm Hg
PHYSICAL STATE	SOLID	SLUDGE	rianio	GAS
	WASTE	MANAGEMENT PRAC	TICES	
SITE SECURITY	SECURE FENCE WITH LOCK	SECURITY GUARD BUT NO FENCE	REMOTE LOCATION OR BREACHABLE FENCE	NO BARRIERS
HAZARDOUS WASTE	0 TO 250 TONS	251 TO 1,000 TONS	1,001 TO 2000 TONS	GREATER THAN 2.000 TONS
TOTAL WASTE QUANTITY	O TO 10 ACRE FEET	11 TO 100 ACRE FEET	101 TO 250 ACRE FEET	GREATER THAN 250 ACRE FEET
WASTE INCOMPATIBILITY	NO INCOMPATIBLE WASTES ARE PRESENT	PRESENT, BUT DOES NOT POSE A HAZARD	PRESENT AND MAY POSE A FUTURE MAZARD	PRESENT AND POSING AN IMMEDIATE HAZAR
USE OF LINERS	CLAY OR OTHER LINER RESISTENT TO ORGANIC COMPOUNDS	SYNTHETIC OR CON CRETE LINER	ASPHALT BASE LINER	NO LINER USED
USE OF LEACHATE COLLECTION SYSTEMS	ADEQUATE COLLEC- TION AND TREATMENT	INADEQUATE COLLEC	INACEQUATE COLLECTION AND TREATMENT	NO COLLECTION OR TREATMENT
USE OF GAS COLLECTION SYSTEMS	ADEQUATE COLLEC TION AND TREATMENT	COLLECTION AND CONTROLLED FLARING	VENTING OR INABE- QUATE TREATMENT	NO COLLECTION OR TREATMENT
USE AND CONDITION OF CONTAINERS	CONTAINERS ARE USED AND APPEAR TO BE IN GOOD CONDITION	CONTAINERS ARE USED BUT A FEW ARE LEAKING	CONTAINERS ARE USED BUT MANY ARE LEAKING	NO CONTAINERS ARE USED

While this list is by no means exhaustive, and other examples may be encountered by raters using the methodology, it does include the more commonly occurring situations. Appendix B provides guidance on the number of additional points that should be assigned for these situations.

In order to maintain the objectivity of the rating methodology while allowing the assignment of additional points, the following limits are placed on the number of additional points that may be assigned in each factor category:

•	Receptors	50 points
•	Pathways	25 points
•	Waste characteristics	20 points
•	Waste management practices	30 points.

The number of additional points allowed in each factor category is a function of the total available rating factor points and the relative importance of the category.

The actual procedure for assigning additional points is outlined in Chapter 4.

2.6 HAZARD POTENTIAL SCORES

The result of a site rating is a set of five hazard potential scores. These scores are:

- Overall score
- Receptors subscore
- Pathways subscore
- · Waste characteristics subscore
- Waste management practices subscore.

The overall score is based on all the rating factors and additional points that are used to rate a site. Each subscore is based on those rating factors

and additional points in that factor category which are used to rate a site. All of these scores are normalized so that they are on a scale of 0 to 100. The normalization procedure is described in Chapter 4. Associated with every hazard potential score is a percentage of missing and assumed data. These percentages flag scores that are based on large amounts of missing data and, generally, measure the reliability of the scores. Chapter 5 describes how to interpret these scores.

Appendix F SITE ASSESSMENT AND RATING FORMS

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

	ump Sit	0		
Location BAR-M				
Commerce BAR-M Commerce Original Dump Site		·		
Commes Original Dump SITE				
				
	PACTOR RATING		FACTOR	HAXZHEM POREZELE
RATING PACTOR	(0-3)	MULTIPLIES		SCORE
RECEPTOR	£			
Population Within 1,000 Feet		4	4	12
Distance to Nearest Drinking Water Well	0	15	0	45
Distance to Reservation Boundary	3_	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	1	· 12	12	36
Water Quality of Mearby Surface Mater Body		6	6	18
Number of Assumed Values = O Our of 6	9	MOTALS	40	138
Percentage of Assumed Values = U		BACORE		<u>-84</u>
Number of Missing Values = 0 Out of 6 Percentage of Missing Values = 6 %		Pactor Score Core and Multi		
PATMOLYS	·			
Evidence of Water Contamination	1	10	10	30
Level of Mater Contemination ASSUMED	1	15	15	45
Type of Contemination, Soil/Biota		5	5	15
Distance to Mearest Surface Mater				
	3	4	12	12
Depth to Groundwiter	<u>3</u> <u>3</u>	7		12
Depth to Groundweter Met Presipitation				12 21
·			12	
Not Presipitation Soil Permeability Assumed		7	12 21 6	
Hec Presipitation	3	7 6	12 21 6	
Not. Presipitation Soil Permeability Assumed Pedrock Permeability N/A		6 6 4	12 21 6 - - 8	
Nec Presipitation Soil Permeability ASSUME d Pedrock Permeability N/A Depth to Bedrock N/A Surface Erosion Number of Assumed Values = 2 Out of 10	3 1 2	7 6 6 4 4 4 4 4 5 TOTALS	12 21 6 6 -	
Not. Presipitation Soil Permeability ASSUME d Pedrock Permeability N/A Depth to Bedrock N/A	3 - 	7 6 6 4 4	12 21 6 6 - - 8 83	18 18 - - 12 171 49

	Site No. 1
<u>Heserdous</u>	Reting: Judgmental rating from 30 to 100 paints based on the following quidelines:
Points	
30	Classi demostis-type lamifill, old site, no known hazardous wastes .
40	Closed demostic-type landfill, recent site, no known hexardous wastes
50	Suspensed small quantities of bassardous westes .
60	These small quantities of baserdous vestes
70	Suspected moderate quantities of hexardoss vestes
80	Tayon maderate quantited of hezardous wastes
90	Supported large quantities of heantdoos wester
100	Known large quantities of hexardons westes
Nesson :	for Anniqued Reservous Recingi Interviews reported materials disposed of
	in landfill included hazardous materials

WASTE HAIRGENENT PRACTICES

RATING FACTOR	FACTOR RATING (0-3)	HULTYPLIER	FACTOR SCORE	MAJEDRIM POSSIBLE SCORE
Record Accuracy and Ence of Access to lite	3	7	al	21
Reserves Wester Quantity Assumed	1	7	7	21
Total Newto Quantity ASSUMED	0	4	0	12
Maste Incompatibility		. 3	3	9
Absence of Liners or Confining Bods	1	•	6	18
Use of Leachete Callestica System	3	6	18	18
Use of Gas Callestion Systems	. 3	2	6	6
Site Clears .	2	•	16	24
Substitute Flore	0	7	0	21
Number of Assumed Values = 2 Out of 9 Percentage of Assumed Values = 221		SUBTOTALS SUBSCORE	77	<u>150</u> 51
Number of Missing and Mon-Applicable Values = O Out of 9 Personnage of Missing and Non-Applicable Values = O 1		(Factor Score Score and Mult		
4 - 4				

Overall Number of Assumed Values = 4 Out of 25
Overall Performance of Assumed Values = 161

OWNERALL SCORE

45

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Waste Characteristics Subscore X 0.24 plus Meste Management Subscore X 0.24)

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of ELEA Site No. 2 Sewa	ae Lago	on		
Location BAR-M	0 0			
Owner/OperatorBAR-M				
comes Lagoon receives liqui	d waste			
generated by site				
				
		····		
	PACTOR BATING		FACTOR	HALCHUM PORETRLE
NATING PACTOR	(0-3)	HULTIPLIER	SCORE	SCORE
RECEPTO	385			
Population Within 1,000 Peet	L	4	4	12
Distance to Nearest Drinking Mater Hell	0	15	0	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	I	· 12	/2	36
Hater Quality of Hearby Surface Hater Body	1	6	6	/8_
Number of Assumed Values = O Out of 6	\$5	PTOTALS	40_	138
Percentage of Assumed Values = 0 %	54	MSCORE		29
Mumber of Missing Values - O Out of 6		actor Score Di		
Percentage of Missing Values - Ot	· 50	pore and Multip	illed by 100))
PATRICAL				
Vidence of Water Contamination	0	10	0	30
evel of Water Contemination	0	15	0	45
ype of Contamination, Soil/Biota	0	S	0	15
istance to Hearest Surface Water	3	4	12	12
epth to Groundwater	3	7	21	21
et Presipitation	1	6	6	18
Assumed	1 .	6	6	18
edrock Permeability N/A		4		
epth to Bedrock NA	-	4	,	
urface Erosian	2	4	8	12
number of Assumed Values = Out of 10	5 0	STOTALS	53	بتيد
Percentage of Assumed Values - 10 1		RECORE		سلكت
number of Missing Values - 2 Out of 10		actor Score Di pore and Multip		
Percentage of Missins Values = 20	-			

	WASTE CHARACTERISTICS	Site 1	Vo. 2
parent	Rating: Judgmental rating from 30 to 100 paints based on the f	ollowing guideline	16:
Points			
30	Closed demostis-type landfill, old sits, no known hazardous	westes .	•
40	Closed demostis-type landfill, recent site, no known besard	ous vestes	
50	Suspected small quantities of baserdous wastes		
60	Rooms small quantities of hexerdous vertee		
70	Suspected mederate quantities of hexardous wastes		
90	Insum moderate quantities of hazardous vestes		
90	Suspected large quantities of hazardous wastes		
100	Enowe large quantities of bezardous wastes		
	and the control of th		40
Nessen	for Assigned Barurdous Parison	_,	
	generated by site	u waste	<u></u>
	- John Mary Williams		

WASTE HANGERERY PRACTICES

ANTING FACTOR	FACTOR NATING (0-3)	HULZIPLIK	FACTOR SCORE	MAXIMIN PORSIBLE SCORE
Record Accuracy and Ease of Access to Site	2	7	14	21
Namerdown Weste Quantity	0	7	0	21
Total Meste Quantity	0	4	0	12
Waste Incompatibility	0	3	0	9
Absence of Liners or Confining Beds		•	6	18
Use of Leachats Collection System	3	6	18	18
Doe of Gas Callestion Systems	3	2	6	6
Site Closure .		•		
Subsurface Flows	0	7	0	21
Number of Assumed Values = O Out of 9 Percentage of Assumed Values = O 1		SUBSCORE	<u>44</u>	126 35
Number of Missing and Mon-Applicable Values = Out of 9 Percentage of Missing and Mon-Applicable Values = 1		(Factor Score Score and Hult		
Overall Number of Assumed Values = Out of 25 Overall Personness of Assumed Values =9	OVERALL S	CORE		34
	(Receptors Subscore X 0.22 plus Pathweys Subscore X 0.30 plus Wasto Characteristics Rubocore X 0.24 plus			

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

tomos of Site Site No. 3 Waste POL						
	e used to	dump we	aste f	OL		
RATING PACTOR	FACTOR FATTING (0-3)	MULTIPLIER	PACTOR SCORE	HAKEMIN POSSTRLE SCORE		
Population Within 1,000 Feet	ECEPTORS	4	4	12		
Distance to Hearest Drinking Water Hell	0	15		45		
Distance to Reservation Boundary	.3	6	18	18		
Land Use/Zoning	0	3	0	9		
Critical Environments	1	- 12	12	36		
Mater Quality of Hearby Surface Mater Body	1	•	6	18		
Number of Assumed Values =Out of 6 Percentage of Assumed Values =% Number of Hissing Values =Out of 6 Percentage of Hissing Values =%		SUBTOTALS 40 138 SUBSCORE 29 (Factor Score Divided by Maximum Score and Multiplied by 100)				

PATHWRYS				
Evidence of Mater Contemination	2	10	20	30
Level of Water Contemination Assumed		15	15	45
Type of Contemination. Soil/Biota	1	5	5	15
Distance to Mearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Not Presipitation	1	6	6	18
Soil Permentility Assumed		. 6	6	18
Bedrock Permeability NIA		4		
Depth to Sedrock		4	_	
Surface Erocian	2	4	8	12
Number of Assumed Values - 2 Out of 10		SUSTOTALS	93	171
Percentage of Assumed Values = 20				54
Number of Missing Values = 2 Out of 10 Percentage of Missing Values = 20	(Factor Score Divided by Maximum Score and Hultiplied by 100)			

	WASTE CHARACTERISTICS		
		Site	No. 3
<u> La seriesse</u>	Rating: Judgmental rating from 30 to 100 paints based on the	following quidel	ines:
<u>Points</u>			
30	Closed demostic-type landfill, eld site, no known hazardous	s vactos	•
40	Closed desectio-type landfill, recent site, no known hazard	lous vestes	
50	Suspected small quantities of heserous vector	-	
40	Names small quantities of hemselous vestes		
70	Suspected mederate quantifies of hexardous vestes		
80	Enorm moderate quantities of hazardous vastes		
90	Suspented large quantities of hazardous wastes		
100	From large quantities of heserdoes wastes		
			50
Peeson	Cor Assigned Reservous Reciny: Objerved Contamination		ستيسي
	Observed Contamination		

WASTE HAIRGENENT PRACTICES

RATING PACTOR	FACTOR PATTING (0-3)	HULSTPLIER	PACTOR SCORE	POSSIBLE SCORE
Record Accuracy and Tame of Access to Site	3	7	21	21
Managious Mosts Quantity	0	7	0	21
Total Maste Quantity	0	4	0	12
Maste Incompatibility	0	. 3	O	9
Absence of Liners or Confining Beds	1	6	6	18
Use of Leachete Callection System	3	6	18	18
One of Gas Collection Systems	3	2	6	6
Elto Closure N/A .		*		
Subsurface Flows	0	7	0	21
Number of Assumed Values = O Out of 9 Percentage of Assumed Values = O 1		SURECORE	51	126 41
Number of Missing and Mon-Applicable Values = Out of 9 Percentage of Missing and Mon-Applicable Values =1		(Factor Score Score and Hult		
Overall Number of Assumed Values = 2 Out of 25 Overall Persontage of Assumed Values = 1	Pathways Waste Che	CORE s Subscore X 0.22 Subscore X 0.20 p racteristics Subs accornt Subscore	lus core X 0,2	44 14 plus

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Hamo of Size Site No. 4				
Location Bor-M		· · · · · · · · · · · · · · · · · · ·		
Outset/Operator_Bar-M				
comme Site is used by station	and	native v	illage	
of Kaktovik				
				
	FACTOR RATZING		PACTOR	POSSIBLE
RATING FACTOR	(0-3)	MULTIPLIER	SCORE	SCORE
RECEPTORS				
Population Within	1	4	u	12
			~	12
Distance to Mearest Drinking Wazer Hell	0	15	\cap	45
Distance to Reservation				
Boundary	3	6	18	18
Land Use/Zoning	0	3	D	9
Critical Environments	\overline{I}	· 12	12.	36
Hater Quality of Hearby	,	-	,	10
Surface Natur Body			4/2	18
Number of Assumed Values = O Our of 6		SUBTOTALS	40	138
Percentage of Assumed Values - O &		SUBSCORE	unidad bu Ma	<u>~7</u>
Mumber of Missing Values - Out of 6 Percentage of Missing Values - O	•	(Factor Score Di- Score and Multip		
Legenda of washing and a				
PATHICUS				
Evidence of Mater Contemination	2	10	20	30
Level of Meter Contamination	_ _	15		
DEFECT OF MICHEL CONTRACTOR		<u></u>	15	<u>45</u>
Type of Contamination, Soil/Biota		S	5	15
Distance to Hearest Surface Water	3	4	12	12
Depth to Groundwater	2	7	21	
			21	21
let Fresipitation			6	18
Soil Paramehility		. 6	6	18
hedrock Permeability	_	4	_	_
Depth to Bedrock	_	4	_	
Surface Erosion	2	4	8	12
Number of Assumed Values = 2 Out of 10		SUSTOTALS	93	171
Percentage of Assemed Values - 20		SURSCORE		54
Number of Missing Values = 2 Out of 10		(Factor Score Div		
Secretary of Mississ Values a 26 s		Score and Multip	lied by 100))

	Site No. 4
<u>Hemrione</u>	Rating: Judgemental rating from 30 to 100 points based on the following guidelines:
Points	
30	Classed demastir-type lamifill, old site, no known hexardous vestes
40	Closed demostic-type landfill, recent site, no known hexactous wastes
So	Suspensed small quantities of hazardous wastes
60	Topum small quantities of hemerdous wastes
70	Suspected addatate quantities of hezardous vestes
80	Rosen mederate quantities of bazardous wastes
90	Suspected large quantities of hazardous waster
100	Known large quantities of bezardous wasten
	streetcost <u>50</u>
Reason	Village of Kaktovik dumping is uncontrolled
	uncontrolled

WASTE HANGEDURY PRACTICES

SATING PACTOR	FACTOR PATING (0-3)	HULTTPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
Record Accuracy and Enes of Access to Site	3	7	21	21
Reservation Name Quantity Assumed	1	7	7	21
Total Neste Quantity ASSUMED	0	4	0	12
Meste Incompatibility	1	. 3	3	9
Absence of Liners or Confining Beds	1	4	6	18
Use of Leachete Collection System	3	6	18	18
Use of Gas Callection Systems	3	2	6	6
Site Closure .	2	•	16	24
Subverface Flows	0	,	0	21
Number of Assumed Values = 2 Out of 9 Perventage of Assumed Values = 22 1		SUBTOTALS SUBSCORE	_77_	<u> 150</u> 51
Number of Hissing and Hon-Applicable Values = Ont of 9 Percentage of Hissing and Hon-Applicable Values = O1		(Factor Score Score and Mult		
Overall Number of Assumed Values = 4 Out of 25 Overall Persuntage of Assumed Values = 16%	OVERALL S	CORE		47
	Pathways	s Subscore X 0,22 Subscore X 0,20 p racteristics Subs	lus	14 plus

Omer/Operator Bar-M Commerce Contamination of	Prainage Cut Drainage Cu awer House		<u>ina Ti</u>	on
RATING PACTOR	FACTOR. RATING (0-1)	MULTIPLIER	PACTOR SCORE	MAXIMUM PORSIBLE SCORE
	RECEPTORS			
Population Within 1,000 Feet	ŧ	4	4	12
Distance to Mearest Drinking Maser Mell	0	15	0	45
Distance to Reservation Boundary	3	6	18	18
Land Dee/Zoning	0	3	0	9
Critical Environments		- 12	12	36
Mater Quality of Hearby Surface Mater Body	1	6	6	18
Number of Assumed Values = O Out of 6	\$	UBTOTALS	36	138
Percentage of Assumed Values = 0 % Number of Hissing Values = 0 Out of 6 Percentage of Hissing Values = 0 %	- ()	SUBSCORE 26 (Factor Score Divided by Maximum Score and Multiplied by 100)		

PATHICLYS				
Evidence of Water Contamination	2	10	20	30
Level of Meter Contentination Assumed	1	15	15	45
Type of Contamination. Soil/Biota		5	5	15
Distance to Hearest Surface Mater	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Frempitation	1	6	6	18
Soil Permentility Assumed		. 6	6	18
Pedrock Permeability N/A	_	4	-	
Depth to Bedrock		4	_	
Surface Erosion	3	4	12	12
Number of Assumed Values = 2 Out of 10		SUSTOTALS	97	17/
Percentage of Assumed Values = 00 % Number of Missing Values = 00 % Percentage of Missing Values = 00 %	SURSCORE UVIDED by Hamisum Score and Multiplied by 1001			

		HASTE CHARCEEST	FFICS .	Sit	e No.	8
Mestardous Raci	ng: Judgemental S	stiny from 30 to 100 paints (based on the fi			
Points						
30	Cloose desertion to	ype landfill, old site, no k	novn hazardous	vastes		
40	Closed desectionty	ppo landfill, recent site, m	o known hesesd	Pus vestes		
So	Suspected small qu	untities of heterdous wester	•	•		
60	know mall quanti	ities of hererdous vestes				
70	Suspected moderate	e quantities of heserdous was	stee			
80	10 Known moderate quantities of hazardous wastes					
90	Suspected large qu	uantities of hezardous wester	•			
100	Kaova large quanti	ities of hazardous westes				
Resea for A	Discharge		SUBSTORI		_5	0
	red for a	nge discharge	10026	<u> </u>		
		Marry Market	MENT PRACTICES			
			WENT MUCITUES			
RATING	PACTOR		FACTOR MATTING (0-3)	HULTTPLIER	FACTOR SCORE	NAXENON POSSZBLE SCORE
·				· · · · · · · · · · · · · · · · · · ·		
Record Acres	eracy and mess to lite	N/A		7		
Hazardons 1	tests Quantity		0	7	_ 0_	21
Total West	Quencity		0	4	0_	12
Waste Incom	specibility		6	. 3	0	9
Abounce of Confining 1				6	6	18
Use of Last Callection		N/A ·		4		
Gee of Gee Collection	Systems	N/A		5		
Site Close	re	N'/A			_	-
Substant Laco	Flows		0	7	0	21
	Nasraned Values			SUSTOTALS	9	81
	of Assumed Values	— <u>"</u>	•	SUBSCORE	B4	-/-
	Missing and Mon-App of Missing and Mon	Applicable Values = 441		(Factor Scere Score and Muli		
	mber of Assumed Val			-		36
West N	rcentage of Assimed	- <u>1</u>	Pathways S Maste Char	Subscore X 0.2 Subscore X 0.30 acteristics Sub- quant Subscore	plus Beore X 9,2	

nome of size Site No. 9 Old	Oumo	Site - N	W	
LORATION RAR-M				
Omner/Operator BAR-M				-
come site located in natura	al drain	rage cut		
Has been cleaned up				
		·		
	PACTOR PATTING		FACTOR	MAKIMIM POSSIBLE
RATING FACTOR	(0-3)	HULTUPLIER	SCORE	SCORE
RECEPTOR	1			
Population Within 1,000 Feet	1	4	4	12
Distance to Nearest Drinking Water Well	٥	15	6	45
Distance to Reservation	3		. 0	101
Roundary Land Use/Zoning	<u> </u>	1	18	- / X -
Critical Invironments	1	· 12	12	36
Water Quality of Hearby	 -		,	
Surface Water Body		6	6	18
Number of Assumed Values = O Out of 6 Percentage of Assumed Values = O t		SUSTOTALS	40	138 29
Humber of Missing Values = OOut of 6		SUBSCORE (Factor Score 01	uddad bar M	
Percentage of Hissing Values - O	•	Score and Multip		
PATHWAYS				
Evidence of Water Contamination	Ó	10	0	30
Level of Water Contemination	Ó	15	0	45
Type of Contemination, Soil/Biotz	0	3	0	15
Distance to Hearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	2.1	21
Net Precipitation	ī	6	6	18
Soil Permentition Assumed	1	. 6	6	18
Dedrock Permanbility N/A		4	_	
Depth to Bedrock N/A	_	<		
Surface Erosion	2	4	8	12
Number of Assumed Values Out of 10		SUSTOTALS	<u>53</u>	17!
Persontage of Assumed Values - 10		SURSCORE		71
Manager of Missing Values Out of 10		(Pactor Score Div Score and Multip		
Persontage of Missing Values - 10 -				

	WASTE CHARACTERISTICS	Site No. 9
<u>in services</u>	Rating: Judgmental rating from 30 to 100 points based on the follow	ring guidelines:
<u>Points</u>		
30	Closed demostir-type landfill, old site, no known hazardous was	tes ·
40	Closed demostis-type landfill, recent site, no known hasardous	vestes
50	Suspensed small quantities of hazardous wastes	
60	Name small quantities of hazardous wastes	
70	Suspected mederate quantities of hexardous wastes	
80	Enorm medorate quantities of hazardous vestes	
90	Suspected large quantities of hazardous wastes	
100	Known large quantities of hazardous wastes	
	\$UBLCORE	<u>50</u>
Reserve	Old dump site received everyth generated at station	iina
	penerated at station	

VANTE HANGEHENT PRACTICES

BATING PACTOR	FACTOR RATING (0-1)	HULTIPLIER	FACTOR SCORE	HAXINUM POSSIBLE SCORE
Record Accuracy and Tage of Access to Site	3	7	21	21
Managedous Maste Quantity Assumed	1	7	7	. 21
Total Merce Quantity Assumed	0	4	0	12
Naste Incompatibility		. 3	3	9
Absence of Liners or Confining Beds	1	6	6	18
Use of Leachate Callection System	3	6	18	18
Toe of Gas Callection Systems	3	2	6	6
Site Closure .	Q		16	24
Substitute Plane	0	7	0	21
Number of Assumed Values = 2 Out of 9 Percentage of Assumed Values = 22		SUBSCORE	77	150 51
Number of Hissing and Hon-Applicable Values = Oct of 9 Percentage of Hissing and Hon-Applicable Values = O %		(Factor Score Score and Hult		
Overall Number of Assumed Values = 3 Out of 25 Overall Percentage of Assumed Values = 124	OVERALL S	CORE		40
· · · · · · · · · · · · · · · · · · ·	Pathweys Maste Cha	s Subscore X 0.22 Subscore X 0.30 p gracteristics Subscore	olus P core X 0.	24 plus

2

Name of 5100 Site No. 12 0	ld Dump	Site		
OMEZ/OPERATOR BAR-M	-BAR-			
		and dur	ing	
Construction - since	cleanedu	0		
RATING FACTOR	FACTOR RATING (0-1)	HULTIPLIER	FACTOR SCORE	HAZDEN POESTELE SCORE
RECEPTO	ORS.			
Population Within 1,000 Feet		4	4	12
Distance to Mearest Drinking Mater Well	0	15	0	45
Distance to Reservation Boundary	3	6	18	18
Land 'Jee/Zoning	0	3	0	9
Critical Environments		· 12	12	36
Water Quality of Hearby Surface Water Rody		6	6	18
Number of Assumed Values = O Out of 6	\$0	ZJATOTALS.	. 40	138
Percentage of Assumed Values = O to of 6		RECORE Actor Soure Di		. 30
Percentage of Minsing Values - 0 %		ore and Multip		
PATHOLIS				
Evidence of Water Contemination	0	10	0	30
Level of Water Contamination		15	0	45
Type of Contamination, Soil/Biota	_ 0	S	0	15
Distance to Hearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Met Presipitation		6	6	18
ASSUME d		6	6	18
Podrock Personalizity N/A		4	_	
Depth to Bedrock N/A		4		
Surface Erosion	2	4	8	12
Mumber of Assumed Values = 1 Out of 10		TOTALS	53	195
Percentage of Assumed Values = 10 s Number of Missing Values = 2 Out of 10		ISCORE Netor Score Div	-	
Percentage of Missing Values - QO		are and Multibl		

	WASTE CHARACTERISTICS	Site No. 12
<u>Hassardens</u>	Rating: Jumpemental rating from 30 to 100 paints based on the	e following quidelines:
Points		
30	Closed demostir-type landfill, old site, no known hazard	ous vestes .
40	Closed semestis-type landfill, recent site, no known haz	artique vaetes
50	Suspensed small quantities of hexardous weeter	•
60	Rooms small quantities of baserdous wastes	
70	Suspected anderste quantities of hemordous vastes	
80	Known moderate quantities of hazardone wantee	
90	Suspected large quantities of hazardous waster	
100	Known large quantities of hazardous wastes	
Nessen 1	Dump received everything ge	

MARTE HUNGSHIENT PRACTICES

PATING PACTOR		PACTOR PATTING (0-3)	HULTTPLIER	PACTOR SCORE	HAZZHUH POSSISLE SCORE
Recerd Accuracy and Ense of Access to Sitz		.3	7	21	21
Hemandons Heate Quantity	Assumed	1	7	7	21
Total Maste Quantity	Assumed	0	4	0	12
Maste Inotopatibility		1	3	3	9
Absumes of Liners or Confining Bods		l	6	6	18
Use of Leachste Callection System		3	6	18	18
Doe of Gas Collection Systems		. 3	2	6	6
Site Closure	N/A		•		
Subsections flows		0	7	0	21
Hamber of Assumed Values	- 22.	9	SUBTOTALS SUBSCORE (Factor Score Score and Mult		
Overall Number of Assumed Val Overall Personness of Assumed	ues - 3 out of 25	Pathways Naste Cha	CORE S Subscore X 0.22 Subscore X 0.30 p racturistics Subs	lus Core X 0,2	39

Name of Size 5ite No. 13 (LOCALISM East of Site -	Old Dump POW-3	Site, l	EAST	
Omez/Operazor (15AF	deactiunted	ih 1971		
RATTING FACTOR	PACTOR RATING (0-1)	MILTIPLIER	PACTOR SCORE	MAXIMUM PORRIBLE SCORE
	BCEPTORS			
Population Within 1,000 Feet	0	4	0	12
Distance to Nearest Drinking water Well	0	15	0	45
Distance to Reservation Roundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Zowirosments		· 12	12	36
Natur Quality of Hearthy Surface Natur Sody ASSUMED		6	6	18
Number of Assumed Values = 1 Out of 6 Percentage of Assumed Values = 17 % Number of Hissing Values = 0 Out of 6 Percentage of Hissing Values = 0 %		METOTALS MEGCORE Pactor Score Di Core and Multip		

	Patimors				
Svidence of Water Contaminati	Assumed	1	10	10	30
Level of Water Contamination	Assumed	1	15	15	45
Type of Contemination, Soil/B		1	5	5	15
Distance to Hearest Surface W	n ter	3	4	12	12
Depth to Groundwater		3	7	21	21
Not Premipitation		1	6	6	18
Soil Permeability	Assumed	1	. 6	6	18
Pedrock Permesbility	NIA	_	4		
Depth to Bedrock	N/A		4	_	
Surface Erosion		I	4	4	12
Number of Assumed Values - 4 Out of 10			SUBTOTALS		171
Percentage of Assumed Values - 40 1			SURSCORE		46
Number of Missing Values - 2 Out of 10 (Pactor Score Divided)					
Percentage of Missing Values	- <u>&U</u>				

	والتناوي المناوي المروان والمنصورات فالمسوات والمساوي والمناوي المناوي المناوي المناوي المناوي والمناوي والمناوي	
	MATE CHARGEDISTICS	Site No.13
<u> La en releva</u>	Pating: Judgmental rating from 30 to 100 paints based on the fo	ollowing guidelines:
Points		
30	Closed desectio-type landfill, old site, no known hazardous	vestes .
40	Closed desestiontype landfill, recent site, so known hexard	Dus vestes
50	Suspected small quantities of hazardous wester	
60	These small quantities of besardous vestes	,
70	Suspected medicate quantities of hazardous wastes	
80	Insum moderate quantities of hazardous wastes	
90	Suspected large quantities of hazardous wastes	
100	Known large quantities of beserdous wester	
	50e420e	50
Resetts :	for received allwast	e aenerated
	by site	- J

WASTE HANAGEMENT PRACTICES

METHS FACTOR	FACTOR BATTING (0-3)	MULTIPLIER	FACTOR SCORE	HALEIMON POSSIBLE SCORE
Retord Accuracy and Dase of Access to Site	3	7	21	21
Passerdone Marte Quartity Assumed		7	7	21
Total Name Quantity A55umed	0	4	0	12
Maste Incompatibility Assumed	1	, 3	3	9
Absence of Liners or Confining Bods		6	6	18
Use of Leachate Callection System	3	6	18	18
Use of Gas Collection Systems	3	2	6	6
site closers Assumed.	3	•	24	24
Substitute Flore	0	7	0	21
Number of Assumed Values = 4 Out of 9 Percentage of Assumed Values = 44		SUBTOTALS SUBSCORE	₹5	150 57
Percentage of Missing and Mon-Applicable Values = Oct of 9 Percentage of Missing and Mon-Applicable Values = O		(Factor Score) Score and Mult:		

Overall Number of Assumed Values - 9 Out of 25 Overall Percentage of Assumed Values - 36

OVERALL SCORE

45

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Maste Characteristics Subscore X 0.24 plus Maste Management Subscore X 0.24)

Non at size Site, No. 16 Old D	umo S	site		
Location Northwest Corner Po		7110		
Owner/Operator POW-2				
come Site has been cleaned	-up			
	PACTOR			MAXIMUM
31.55ma - 51.55ma	MATING (0-3)		PACTOR	POSSIBLE
NATING PACTOR	(0-3)	HULTIPLIER	SCORE	SCORE
RECEPTORS		<u></u>		
Population Within 1,000 Feet	٥	4	O	12
Distance to Nearest				
Drinking water Well	0	15	6	45
Distance to Reservation	3		la	1.0
Soundary	<u> </u>		18	18
Land Use/Zening		3		9_
Critical Environments		· 12	12	<u> 36</u>
Natur Quality of Hearby Serface Natur Body ASSumed	1		6	18
Number of Assumed Values = Out of 6	5	URTOTALS	36	138
Percentage of Assumed Values = 17 %	9	UBECORE		ब्रह
Number of Missing Values - O Out of 6		Pactor Score Di		
Percentage of Missing Values - Ot	•	core am wareth	TTOT DY 100	•
PATHICALS	·			
	1	10	10	30
Pridence of Water Contamination	<u> </u>	10) () 15	<u>30</u> 45
Total of Mater Contamination A 550 Med	<u> </u>		<u> 0</u> 15 5	30 45 15
Svidence of Water Contamination Level of Water Contamination ASSUMED Type of Contamination. Soil/Biota ASSUMED	1 1 1 3	15		30 45 15
Total of Mater Contamination A 550 Med	1 1 1 3 3	15	15 5 12	15
Svidence of Water Contamination Level of Mater Contamination ASSUMED Type of Contamination. Soil/Biota ASSUMED Distance to Mearest Surface Mater	<u> </u>	15 5 4	15 5	15 12
Evidence of Water Contamination Level of Water Contamination ASSUMED Type of Contamination. Soil/Biota ASSUMED Mistance to Mearest Surface Water Depth to Groundwater Het Precipitation	<u> </u>	15 5 4 7	15 5 12	15 12
Evidence of Water Contamination Level of Water Contamination ASSUMED Eype of Contamination, Soil/Biota ASSUMED Distance to Mearest Surface Water Depth to Groundwater Not Presipitation	<u> </u>	15 5 4 7	15 5 12	15 12
Evidence of Water Contamination Level of Water Contamination ASSUMED Type of Contamination, Soil/Biota ASSUMED Distance to Mearest Surface Water Depth to Groundwater Not Precipitation Soil Permeability ASSUMED	<u> </u>	15 5 4 7 6	15 5 12	15 12
Evidence of Water Contemination Level of Water Contemination ASSUMED Type of Contemination. Soil/Biota ASSUMED Distance to Mearest Surface Water Depth to Groundwater Not Precipitation Soil Permeability ASSUMED Medrock Permeability N/A	<u> </u>	15 5 4 7 6	15 5 12 21 6 6 - 4	15 12
A SSUMED ASSUMED ASSUM	3 1 -	15 5 4 7 6 6 4	15 5 12	15 12 21 18 18 - - 12
Evidence of Water Contemination Level of Water Contemination ASSUMED Expe of Contemination, Soil/Biota ASSUMED Distance to Mearest Surface Water Depth to Groundwater Not Premipitation Soil Permeability ASSUMED Depth to Bedrock N/A Surface Evosion	3 1 1 1	15 5 4 7 7 6 6 4 4 4	15 5 12 21 6 - - 4	15 12 21 18 18 - - 12 171 46

	WASTE CHARGERISTICS	Site No. 1
Manardona	Sating: Judymental rating from 30 to 100 paints based on the f	following guidelines:
Points		
30	Clased demostis-type landfill, old site, no known hazardous	· wastes
40	Closed demostic-type landfill, resent site, no known hazard	lous vaetes
50	Suspected small quantities of hasterdous wastes	
60	Names small quantities of hexardons vastes	•
70	Suspected moderate quantities of hexardous westes	
00	Rayum medegrate quantities of hazardous wastes	
90	Suspected large quantities of hazardoss wastes	
100	Names large quantities of hexardons wastes	
Benene (SURSCON	
	Old Dump Site Received	Everything
	generated by site	
		

WASTE HANGEPERF PRACTICES

MATING FACTOR	FACTOR NATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXINUM POSSIBLE SCORE
Report Accuracy and			-	
Enes of Access to Site	3	7	21	-21
Masardons Marke Quantity ASSUMED	\overline{L}	7	7	21
Total Newto Quantity ASSUMed	0	4	0	12
Waste Incompatibility ASSUMED		3	3	9
Absence of Liners or Confining Bata		6	6	18
Use of Leathste Callection System	3	6	18	18
Goo of Gas Callestion Systems	3	2	6	6
Elte Cleare .	3	•	24	24
Substitute Flows	0	7	0	21
Number of Assumed Values = 3 Out of 9 Percentage of Assumed Values = 331		SURSCORE	85	150 57
Number of Missing and Mon-Applicable Values = O Ost of 9 Percentage of Missing and Mon-Applicable Values = O 1				
Overall Number of Assumed Values - 6 Out of 25 Overall Personness of Assumed Values - 24		CORE		45
•	Pathways Maste Cha	s Subscore % 0.22 Subscore % 0.30 p racteristics Subs segment Subscore	lus Rore X 0.2	4 plus

2

Name of Size Site No. 17 Curr LOSSESSON Northwest Corner - DOMESTOPPERSON POW-2 COMMENTE SITE RECEIVES INCIR Debris including batt	ent Dum Pow-2 erator As	h and	other	
RATING PACTOR	FACTOR RATING (0-1)	HOLTIPLIER	FACTOR SCORE	MAXIMIM PORSIBLE SCORE
NICTP .	TORS			
Population Within 1,000 Feet	1	4	4	12
Distance to Hearest Drinking Water Hell	0	15	0	45
Distance to Reservation Boundary	3	6	18	18
Lank Use/Zoning	0	3	0	9
Critical Environments	1	· 12 .	12	36
Hater Quality of Hearby Surface Water Body ASSUMED	<u>-</u>	6	6	18
Number of Assumed Values = Out of 6	s	BTOTALS	36	/38
Percentage of Assumed Values = <u>17</u> % Number of Missing Values = <u>0</u> Out of 6 Percentage of Missing Values = <u>0</u> %	(1	MACCORE Pactor Score Dir Core and Hultip		

PATHOLYS					
Svidence of Water Contamination	1	10	10	30	
Level of Water Contemination ASSUMED		15	15	45	
Type of Contamination. Soil/Biots	1	S	_ 5	15	
Distance to Hearest Surface Water	3	4	12	12	
Depth to Greundenter	3	7	21	21	
Not Presipitation	Ī	6	6	18	
soil Permobility Assumed	1		6	18	
Sedrock Perheability N/A	-	4		-	
Depth to Dedrock N/A		4			
Surface Erocion	1	4	4	12	
Number of Assumed Values - 2 Out of 10		SUSTOTALS	79	171	
Percentage of Assumed Values - 20 1	SURSCORE				
Number of Missing Values - 2 Out of 10 Percentage of Missing Values - 20	(Pactor Score Divided by Maximum Score and Multiplied by 100)				

	Site No.	17
Rosardone P	ating: Judgmental rating from 30 to 100 points based on the following guidelines:	•
<u>Points</u>		
30	Closed demostis-type landfill, old site, no known hazardous wastes	
40	Closed descette type landfill, recent site, no known hazardous wastes	
50	Suspected small quantities of hasserdous vactor	
60	Thoma small quantities of hexerdous vestes	
70	Suspected moderate quantities of hazardous vestes	
80	Enous scalarate quantities of hazardous vactor	
90	Suspected large quantities of hazardous wastes	
100	Known large quantities of basardous wastes	
	SUBSTANCE.	40
Readon Sc	Site is controlled, should be	
	receiving no hazardous moterials	

WASTE HAMAGINERY PRACTICES

RRTING FACTOR	FACTOR BATTING (0-3)	MUSTPLIER	FACTOR SCORE	HARDIUM PORSIBLE SCORE
Record Accuracy and Ease of Access to Site	3	7	21	<u></u>
Herendone Heere Quantity Assumed	0	7	0	21
Total Waste Quantity	0	4	0	12
Mesta Incompacibility Assumed	. 0	. 3	0	9
Absence of Liners or Confining Beds		6	6	18
Use of Leachate Collection System	. 3	6	18	18
Toe of Gas Callection Systems	. 3	2	6	6
Site Classes N/A		8	_	
Subsurface Flove	0	7	0	21
Number of Assumed Values = 2 Out of 9 Percentage of Assumed Values = 221		SUBSTOTALS SUBSCORE	_51	126 40
Number of Hissing and Hon-Applicable Values =		(Factor Score Divided by Maxi Score and Hultiplied by 100)		
Overall Number of Assumed Values - 5 Out of 25 Overall Percentage of Assumed Values - 20	OVERALL	OVERALL SCORE 39		
<u>—</u>	Pathway	ors Subscore X 0.2 s Subscore X 0.30 haracteristics Sub	plus	74 plus

Man of Size Site No. 20- Fu	el Oil Sp	i 1/		
Losseion Adjacent to Hange	er POW-2			
Omer/Operator POW-2		77		
	pilling ~ 3	100 gall	095	
Of fuel oil				
	PACZOR.			MAXIMUM
	MATING		PACTOR	POSSIBLE
NATING FACTOR	(0-3)	HULTIPLIER	SCORE	SCORE
RECE	PTORS			
Population Within 1,000 Feet	0	4	0	12
Distance to Mearest Drinking Water Hell	0	15	0	45
Distance to Reservation Boundary	<u>a</u>	6	12	18
Land Use/Zening	0	3	0	9
Critical Environments	1	· 12	12	36
Hater Quality of Hearby Surface Mater Body	1	6	6	/8
Number of Assumed Values = _ O Out of 6	90	BTOTALS	30	/38
Percentage of Assumed Values - 0	94	BESCORE		22
Number of Hissing Values - Out of 6		actor Score Di		
Percentage of Missing Values = 0 %	36	ore and Multip	ries by to	U 1
PATHWAY				
Evidence of Water Contamination	Ö	10	0	30
Level of Water Contempation	0	15	0	45
Type of Contamination, Soil/Riota	0	S	0	15
Distance to Nearest Surface Water	2	4	Ý	12
Depth to Groundwater	3	7	21	21
Hec Precipitation		6	6	18
soil Permentility Assumed		6	6	18
Pedrook Permosbility N/A	<u> </u>	4		
Depth to Bedrock		4		
Serface Erosion '		4	4	12
Number of Assumed Values = Out of 10		PTOTALS	45	/7/
Percentage of Assumed Values = 10 % Number of Missing Values = 2 Out of 10		RSCORE motor Score Di		<u>a b</u>
manner of Elected Values of /3 (200 Af 10				

	WASTE CHANC	TERRIFFICA	Site 1	Vo. 20)
sarious Ra	ting: Judyamental rating from 30 to 100 pai	nts based on the fe	lla-ing guidolis	LOS :	-
ince					
30	Closed demostir-type landfill, old site,	no known heserdous :	uns tos	•	
40	Closed demostis-type landfill, rement sit	e. no known hezardon	us vestes		
50	Suspected small quantities of hamirdous w	estes .			
60	Known small quantities of heserdous wester	•			
70	Suspected mederate quantities of hezardou	s westes			
0 0	Known mederate quantities of hazardous was	tes			
90	Suspected large quantities of hamardous w	estes			
00	Known large quantities of hexardous weste	•			
				5	0
hocoon for	Assigned Hexardous Fating:	STREETORE		ن	<u>U</u>
	Oil Spill		·		
					
	WATE N	UNGERUNT PRACTICES	,		
		PACTOR			MARTINI
PATTI	IS PACTOR	(0-3)	MULTIPLIER	FACTOR	POSSIBLE SCORE
					
	curacy and losses to Site	ΑΙΙΔ	7		
~ ~~~	Hayte Quantity	<u>N/A</u>		$\overline{}$	0.1
		<u> </u>		$-\overset{\sim}{\circ}$	21
	ste Quentity	<u> </u>	. — — ·	$-\overset{\circ}{\circ}$	12
	tomps tibility	O		<u> </u>	
Contining	of Liners or 1 Toda	1	6	6	18
Use of La		Λ//Δ			
Doe of G	<u></u>	/ <i>V</i> //T			
	n Systems	NIA	2	-	
\$1 to Clos	pare .	Λ/ '/A			

Overall Number of Assumed Values - / Out of 25
Overall Permentage of Assumed Values - /

Personcage of Missing and Non-Applicable Values = 44

er of Assumed Values - O Out of 9

stage of Assumed Values - 0 1

OVERALL SCORE

26

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Maste Characteristics Subscore X 0.24 plus Maste Management Subscore X 0.24)

(Factor Score Divided by Maximu Score and Multiplied by 100)

7

SUSTOTALS

SUBSCORE

LOGARIAN SITE No. 25 - S LOGARIAN Beach North of S CHARLEST POW-1 COMMENTS SEWAGE DISPOSED	ite Pow-1			
RATING PACTOR	PACTOR BATTING (0-1)	MULTIPLIER	FACTOR SCORE	HAZZIEM PORTELE SCORE
Population Within 1,000 Feet	EFFCORS	4	4	12
Distance to Hearest Drinking Macar Hell	0	15	0	45
Distance to Recervation Roundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	1	- 12	12	36
Surface Mater Body A 55 um CO		6	6	18
Humber of Assumed Values = / Out of 6 Percentage of Assumed Values = / Out of 6 Humber of Missing Values = Out of 6 Percentage of Missing Values = O		UBTOTALS UBSCORE Factor Score Di core and Multip		

PATMO	rs			
Bridence of Water Contamination	0	10	0	30
Level of Mater Contemination	0	15	Ó	45
Type of Contemination, Soil/Biota	0	5	0	15
Distance to Mearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	I	6	6	18
Soil Permanulity Assumed		. 6	6	18
Pedrock Permenbility N/A	-	4	_	
Depth to Redrock N/A		4	_	
Surface Erosion	1	4	4	12
Number of Assumed Values =Out of 10		SUBTOTALS	_49_	171 29
Percentage of Assumed Values = 10 \ Number of Missing Values = 2 Out of 10 Percentage of Missing Values = 20 \			Divided by M tiplied by 10	ex i man

	Site No. 25
Nemardons !	gring: Judgemental rating from 30 to 100 points based on the following guidelines:
Points	
30	Closed demostis-type landfill, old site, no known hazardous wastes
40	Closed demostis-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hasardons wastes
60	Report small quantities of heserobus vestes
70	Suspected medicate quantifies of hexardous wastes
00	Regum moderate quantities of hazardous wastes
90	Suspected large quantities of hazardons wastes
100	Known large quantities of hazardous wastes
to	SUBSTINES 30
	Domestic sewage disposal site:

WASTE HANGEDENT PRACTICES

ENTING FACTOR	FACTOR BATTING (0-1)	HULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
Record Accuracy and Race of Access to Site	3	7	21	21
Hammadows Waste Quantity ASSum	od 0	7	0	21
Total Wests Quantity ASSUM		4	0	12
Maste Incompatibility ASSUME		. 3	0	9
Absence of Liners or Confining Beds		6	6	18
Use of Leachatz Callection System	A	6	-	
Use of Gas Callection Systems	'A -	2		
Site Closure //	/A -		_	
Substitute Flore	_ 0	7	0	21
Number of Assumed Values = 3 Out of 9 Percentage of Assumed Values = 33	2	SUBTOTALS SUBSCORE	_27	102 26
Number of Hissing and Hon-Applicable Values of Percentage of Hissing and Hon-Applicable Value	- 3 out of 9	(Factor Score Score and Hult		
Overall Number of Assumed Values - 5 Out of	of 25			1 c/

Overall Number of Assumed Values - 5 Out of 25 Overall Personness of Assumed Values - 20

OVERALL SCORE

98

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Neste Characteristics Subscore X 0.24 plus Meste Menegement Subscore X 0.24)

Site No. 28- POL	Storag	P Aces		
west of Site - POW)-1 ar	Aira		
O-MEZ/OPERALEE POW-1				
	troleum			
evidence of surface	<u>uater</u>	CONTOMI	na tiev	1
			··· -	
	FACTOR.			MAXIMA
BATTING PACTOR	RATING (0-3)	HULTIPLIER	FACTOR	POSSIBLE
BACEPTON:				
Population Within			 · ·	
1,000 Feet	1	4	4	12
Distance to Mearest	^			./.
Drinking Water Well	0	15	0	<u>₩</u> 5
Distance to Reservation Boundary	.3	6	18	18
Land Use/Zoning	0	3	6	9
Critical Environments	$-\overline{i}$	- 12	12	36
Mater Quality of Hearby			,	<u> </u>
Surface Water Body A 550 med			6	<u>/Y</u>
Number of Assumed Values = Out of 6		BROTALS	40	138
Percentage of Assumed Values = 1/5 Number of Hissing Values = 0 Out of 6		mscore actor Score Di	vided by M	
Percentage of Missing Values -		ore and Multip		
PATHMAYS	· · · · · · · · · · · · · · · · · · ·			
Evidence of Weter Contamination	2	10	20	30
Level of Mater Contemination ASSUMed	2	15	30	45
Type of Contemination, Soil/Biota ASSUMP d	2	5	10	15
Distance to Hearest Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Met Precipitation	Ī	6	6	18
Assumed	1 .	6	6	18
Pedrock Personability N/A	_	4		
Depth to Bedrock N ¹ /A		4	_	
Surface Erosion	l	4	4	12
Number of Assumed Values - 3 Out of 10	SU	STOTALS	10.5	171
Percentage of Assumed Values = 30 v		RSCORE		
Number of Rissing Values - d Out of 10		ector Score Di		

Percentage of Hissing Values - 201

	MASTE CHAMCTERISTICS	Site	No.	28
No zardone	Rating: Judgemental rating from 30 to 100 paints based on the			
Polate				
30	Closed demostis-type landfill, old site, so known hezerde	nes westes		
40	Closed demustic-type landfill, recent sits, no known hase	usdous vestes		
50	Suspected small quantities of hassandous wastes			
60	Rooms small quantities of hazerdous vastes			
70	Suspected moderate quantities of hezardous wastes			
80	Enorm underste questites of hazardous vastes			
90	Suspected large quantities of hesardous wastes			
100	Known large quantities of hazardous westes			
		CORE		50
Reside	for Assigned Rezervous Recing: Observed Contamination	of st	oraa	0
	pand		J	

MASTE HANAGEMENT PRACTICES

BATING PACTOR		FACTOR RATING (0-1)	MULTIPLIER	FACTOR SCORE	MAXIMEN POSSIBLE SCORE
Record Accuracy and Ease of Access to Sitz		3	7	21	21
Anserdors Meste Questity	Assumed	0	7	0	21
Total Meste Quantity	Assumed	0	4	0	12
Maste Incompatibility	Assumed	0	. 3	0	9
Abounce of Liners or Confining Bods		1	6	6	18
Use of Leachets Collection System	N/A		6	_	
One of Gas Callestion Systems	N/A	_	2	_	
Site Closure	N'I A				
Subsurface Flove		0	7	0	21
Number of Assumed Values = 2 Percentage of Assumed Values = Number of Hissing and Hon-Appl Percentage of Hissing and Hon-	331 icable values = 3 one o	oe 9	SUBTOTALS SUBSCORE (Factor Score Score and Mult		
Overall Humber of Assumed Valu Overall Percentage of Assumed	- 7 Out of 25	Pathweys 3 Neste Char	ORE Subscore X 0.22 Mascore X 0.30 p seteristics Subscore	lus Core X 0,2	43

Mano al Rico Site No. 29 - K	<u>) le sel Fu</u>	PI OF	2111	
Northwest Of	<u> Site - Pow-</u>			
Commerce 25.000 aglion 0	liesel fuel	SOIL .	-1978	
				
	FACTOR		· · · · · · · · · · · · · · · · · · ·	MAXIMIN
RATING FACTOR	RATING (0-3)	MILTIPLIE	PACTOR R SCORE	POSSTBLE SCORE
180	EPTORS			
Population Within 1,000 Feet		4	4	12
Distance to Neerest Drinking water Well	0	15	0	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments		· 12	12	36
Natural Quality of Nearby Surface Natur Body A SSU In CO		6	6	18
Number of Assumed Values =Out of 6	80	BTOTALS	40	/38
Percentage of Assumed Values = 17 \		RECORE		<u> 29</u>
Percentage of Assumed Values = 17 % Number of Hissing Values = 0 Out of 6 Percentage of Hissing Values = 0 %	(F	RECORE Actor Soore ! Ore and Hult:	Divided by N	
Number of Missing Values - O Out of 6	(F	actor Score	Divided by N	
Number of Missing Values - O Out of 6	(P	actor Score	Divided by N	
Number of Missing Values - O Out of 6 Percentage of Missing Values - O a	(P	actor Score	Divided by N	
Number of Missing Values - O Out of 6 Percentage of Missing Values - O % PATHN Vidence of Mater Contamination	AYS	actor Score ! Ore and Mult:	Divided by N	01
Percentage of Missing Values - 0 out of 6 Percentage of Missing Values - 0 t PATTING Vidence of Mater Contamination ASSUME	AYS O d 1	actor Soore Pore and Multi	Divided by Miplied by 10	30
Percentage of Missing Values - O out of 6 Percentage of Missing Values - O t PRINTE	AYS O d 1	actor Score to ore and Hultu	Divided by Notice by 100	30 45
PATRIM PATRIM	AYS O o d 1	actor Score to ore and Multi-	Oivided by Notiplied by 100	30 45 15
Percentage of Missing Values - 0 out of 6 Percentage of Missing Values - 0 to PAINN Avidence of Mater Contamination ASSUME	ATS O O O O O O O O O O O O O O O O O O O	actor Score to ore and Multi-	O 15 5 /2	30 45 15
PATTING Patrontage of Hissing Values - 0 out of 6 Percentage of Hissing Values - 0 o PATTING Patrontage of Mater Contemination Assume Assume Assume Historica to Hearest Surface Water Appendix to Groundwater	ATS O O O O O O O O O O O O O O O O O O O	actor Score Para and Hultu	O 15 5 12 21	30 45 15

Percentage of Assumed Values = 30 %
Number of Missing Values = 2 Out of 10

Percentage of Missing Values - 3.0 .

SUSTOTALS

(Pactor Score Divided by Maximum Score and Multiplied by 100)

	MAFTE CHAMCTERISTICS	Site	No. 29
<u> Messerious</u>	Rating: Judgemental rating from 30 to 100 paints based on th	e fellowing guidel	ines:
<u>Points</u>			
30	Closed demostic-type landfill, old site, so known hezard	ous wastes	•
40	Classed demontis-type landfill, recent site, no known has	actions vestes	
50	Suspensed small quantities of hexardous wastes		
60	Names small quantities of heserdous vestes		
70	Suspected mederate quantilities of heserdous wastes		
80	Known moderate quantities of hazardous wastes		
90	Suspected large quantities of hazardous wastes		
100	Knows large quantities of hezardous westes		
Resson (for Assigned Basardous Racing: 25,000 gallon fue 1 50i		50

WASTE HANGEMENT PRACTICES

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMM POSSIBLE SCORE
Record Accuracy and Ease of Access to Site N/A		7		
Pagardons Names Quantity ASSUMED	1	7	7	21
Total Maste Quantity N/A		4		
Maste Incompatibility	0	3	0	9
Absence of Liners or Confining Bods		6	6	18
Une of Leachete Callection System N/A			_	
Une of Gas Callestion Systems // A		2		
Site Closure N'/A		•		
Subsurface Flows	()	7	0	21
Number of Assumed Values = 1 Out of 9 Percentage of Assumed Values = 11 Tall Part of 9 Number of Hissing and Hon-Applicable Values = 5 Out of 9		SUBTOTALS SUBSCORE	_13	69 19
Percentage of Missing and Mon-Applicable Values = 55's	•	(Factor Score) Score and Mult:		
Overall Number of Assumed Values - 5 Out of 25 Overall Percentage of Assumed Values - 20	OVERALL SC	ORE		36
	Pathways ! Waste Chai	Subscore X 0.22 Subscore X 0.30 p. Pacteristics Subscore	lus core X 0.2	4 Plus

Name of Site Site No.31 01 LOCATION West End of Saltus OWNER/Operator POW-1 Comments Site Was used prin			Pow-1	
NATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	HAKIMAN POSSTALE SCORE
Population Within	<u> </u>			
1,000 Peat	1	4	4	/2
Distance to Nearest Drinking Water Well	0	15	0	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	Ī	- 12	12	36
Surface Water Body Assumed	ĺ	6	6	18
Number of Assumed Values = Out of 6 Percentage of Assumed Values = Out of 6 Percentage of Missing Values = Out of 6	\$4.	PROTALS RECORE Pactor Score Divore and Multip		
PATHMAYS				
Nidesce of Water Contamination	1	10	10	30
evel of Nater Contestination ASSUMED	Ī	15	15	45
Type of Contemination. Soil/Biota	1	5	5	15
Mistagoe to Hearest Surface Nater	2	4	12	/ 2

Evidence of Water Contamination		10	10	_30
Lovel of Mater Contemination ASSUMED		15	15	45
Type of Contamination, Soil/Biota	1	5	5	15
Distance to Mearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	1	6	6	18
soil Permeebility Assumed	1	. 6	6	18
Pedrock Permeability N/A		4	_	
Depth to Sedruck N/A		4		_
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUSTOTALS	79	111
Percentage of Assumed Values - 80 1		SURSCORE		46
Number of Missing Values - 2 Out of 10	(Factor Score Divided by Maximum			
Percentage of Missing Values = 20:		Score and Mult	iplied by 100)

	Site No. 31
Hazardous	Reting: Judgemental rating from 30 to 100 paints based on the following quidelines:
Politie	
30	Closed demostis-type landfill, old site, no known hazardous wastes
40	Closed demontis-type landfill, recent site, no known hazardous wastes
50	Suspected small quantities of hazardous wastes
60	Names small quantities of hamardove wastes
70	Suspected moderate quantities of hemandous wastes
00	Rapum mederate quantities of hamardone wastes
90	Suspected large quantities of hazardous wastes
100	Recove large quantities of hexardous westes
	50 State 2002
	Dumo received all waste generated at site

WASTE HANGEMENT PRACTICES

NATING PACTOR	FACTOR NATING (0-3)	MULTIPLIER	FACTOR SCORE	HAZIHUH POSSIBLE SCORE
Record Accuracy and Ense of Access to Site	3	7	21	21
Masardona Maste Quantity Assumed	Ī	7	7	21
Total Maste Quentity ASSUMED	0	4	Ó	12
maste Incompatibility ASSUME O	1	3	3	9
Absence of Liners or Confining Beds	1	6	6	18
Use of Leachate Collection System	3	6	18	18
Use of Gas Callection Systems	3_	2	6	6
Site Clasure .	3	•	24	24
Schourfees Flows	0	7	0	21
Number of Assumed Values = 3 Out of 9 Percentage of Assumed Values = 331		SUBSTOTALS SUBSCORE	85	150 57
Number of Missing and Mon-Applicable Values = O Out of 9 Percentage of Missing and Mon-Applicable Values = O 1		(Factor Score Divided by Maximum Score and Multiplied by 100)		

Overall Number of Assumed Values = 6 Out of 25
Overall Percentage of Assumed Values = 21

OVERALL SCORE

46

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Maste Characteristics Subscore X 0.24 plus Maste Management Subscore X 0.24)

RATING PACTOR (0-3) MULTIPLIER SCORE SCORE Population Within 1,000 Feet					
MATING FACTOR	RATING	MULTIPLIER		MAKIMAM POSSIBLE SCORE	
	RECEPTORS				
		4	4	12	
	0	15	0	45	
	3	6	18	18	
Land Use/Zoning		3	0	9	
Critical Environments	1	- 12	12	36	
Surface Water Body ASSUMCO	1 1		6	18	
Number of Assumed Values =Out of 6		UNTOTALS	40	138	
Percentage of Assumed Values -17	-	Wescort		24	
Number of Rissing Values - Out of 6 Percentage of Rissing Values - Ot		(Factor Score Divided by Naximum Score and Multiplied by 100)			

PATIMINYS				
Evidence of Water Contemination	1	10	10	30
Level of Mater Contamination ASSUMED		15	15	45
Type of Contemination, Soil/Biota		5	5	15
Distance to Hearest Surface Meter	3	4	12	12
Depth to Groundwiter	3	7	21	21
Het Precipitation		6	6	18
Soil Permentility Assumed	1	. 6	6	18
Pedrock Permeability N/A	_	4		
Depth to Bedrock		4		
Surface Erosion	1	4	4	12
Number of Assumed Values = 2 Out of 10		SUBTOTALS	79	-111 46
Percentage of Assumed Values = 0.0 % Number of Missing Values = 0.0 Out of 10 Percentage of Missing Values = 0.0 %	SURSCORE (Factor Score Divided by Maximum Score and Multiplied by 100)			X JAMES

	MASTE COMMICTERISTICS	Site	No. 32
Namerdone 1	Rating: Judgemental rating from 30 to 100 paints based on th	e following guid	olines:
Points			
30	Closed demostis-type lamifill, old site, no known hazard	ege vestes	•
40	Closed demostir-type landfill, recent site, no known haz	ardous vestes	
50	Sespected small quantities of besardous wester		
60	Resons small quantities of homoratous wastes		
70	Suspected moderate quantities of hassardous wastes		
80	Known moderate quantities of hazardous vastes		
90	Suspected large quantities of hemordous wastes		
100	Known large quantities of hazardous wastes		
•		2008	50
Resson &	Currently receives site ge	hatoran	(1) a ste
	and waste generated by	Husku	0,1
	and Geophysycal Survey		
	' ' '		

WASTE HANGEPIERT PRACTICES

ANTING PACTOR	FACTOR RATERS (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSEIBLE SCORE
Record Accuracy and Ease of Access to Site	3	7	21	21
Manardone Mosta Quantity ASSUMED		7	7	21
Total Nanto Quantity ASSUMEd	0	4	0	12
Maste Incompatibility ASSUMEd		. 3	3	9
Absence of Liners or Comfining Bods		•	6	18
Use of Leachste Cellection System	3	6	18	18
Use of Gas Callection Systems	· 3	2	6	6
Site Closure	3	•	24	24
Subsurface Flows	0	7	0	21
Number of Assumed Values = 3 Out of 9 Perventage of Assumed Values = 33 \(\) Number of Missing and Mon-Applicable Values = \(\sum_{1} \) Perventage of Missing and Mon-Applicable Values \(\sum_{1} \)	•	SUBSCORE (Factor Score Divided by Maximum Score and Multiplied by 100)		150 51
Overall Humber of Assumed Values = 6 Out of 25				44

Overall Member of Assumed Values - 6 Out of 25 Overall Percentage of Assumed Values - 37

OVERALL SCORE

44

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Weste Characteristics Subscore X 0.24 plus Meste Management Subscore X 0.24)

		Fuel St	orage	
)- M			
	150 th	is was		
Location North of Site. POW-M Comments POUL-M Comments Identify A Site Undiked, also this Was Site of fuel Spill PACTOR RATING PACTOR RECEPTORS POPULation within 1,000 Feet Distance to hearest Distance Distance to hearest Distance Distance to hearest Distance Distance to hearest Distance				
	RATING PACTOR		MILTIPLIER	
NOTTH OF SIFE POW-M POULT OF FUEL SPILL PACTOR NATING FACTOR NA				
	1	4	4	12
Distance to Negrost Drinking water Well	0	15	0	45
Distance to Reservation Boundary	<u></u>	6	12	18
Land Use/Zoning		3	0	9
Critical Environments		- 12	0	36
Surface Valley of Hearby ASSUmed	i	6	6	
Number of Assumed Values = Out of 6	s	DITOTALS	22	138
Percentage of Assumed Values = 17_5	_			4
PATRAYS				
		10	^	31
				30
WAST OF METER CONTENTINETION	0	15	0	<u>45</u>
ype of Contamination, Soil/Biota	0	\$	0	15
tistumos to Mearest Surface Mater	.3	4	12	12
Nepth to GroundMater	3	7	21	21
let Precipitation	Ī	6	6	18
ois Permeability Assumed	1 .	6	6	18
Nedrock Permeability N/A		4	_	
repth to Redrock N/A	_	4		
Burface Erocion		4	4	12
Number of Assumed Values = 1 Out of 10			49	$\frac{171}{29}$
Number of Missing Values - 1 Out of 10			vided by Ma	*1 155
becomes of Mississ Values = AOs		ore and Multip		

	_	MASTE CHARACTE	iteries .	Site No	. 33	
oserdous R	Site No. 33 NESTE CHARACTERISTICS Site No. 33 NESTE NUMBEROSTICS: Judgemental Enting from 30 to 100 points based on the following quidelines: Closed demestic-type landfill, old site, no known hazardous wastes Closed demestic-type landfill, recent site, no known hazardous wastes Semperted small quantities of hazardous wastes Entere small quantities of hazardous wastes Entere selectate quantities of hazardous wastes Semperted large quantities of hazardous wastes Entere large quantities of hazardous wastes Entered Subscribes Rating: FUP Spill WASTE HANGEMENT PRACTICES					
oists						
30	Classi denostis-ty	pe landfill, old site, so	losen hezerdous	unstes	•	
40	Closed denostis-ty	pe landfill, recent site.	no known hazando	us whites		
50	Suspensed small qu	entities of heserdous was	tes .			
60	Rates small quarti	ties of heserdous vestes				
70	Suspected understa	quantities of hexardous	estes			
80	Zapra molegate que	ntites of Maarious whete	•			
90	Suspected Large qu	satities of h <u>esprodus</u> was	tes			
100	Known large quanti	ties of basardous wastes				
	Fuel	Spill wate have	GENERIT PRACTICES			
PATE	MG FACTOR		FACTOR NATING (0-1)	MUSTPLIER	FACTOR SCORE	MAKEMUM POSSERLE SCORE
	oruracy and Access to Site		3	7	21	21
Magazden	s Maste Quantity	Assumed	Ô	7	0	21
Total Na	ste Quantity	Assumed	0	4	0	12
Mayte In	ormpa cibility	Assumed	0	3	0	9
Absence Comfinin	of Liners or g Neds			6	6	18
Dee of L Collecti	eschete on System	N/A	***	6		
Callesti	es es Systems	NIA	·	2		

Overall Number of Assumed Values = 5 Out of 25 Overall Percentage of Assumed Values = 20°

Permantage of Missing and Mon-Applicable Values = 33

er of Missing and Mon-Applicable Values = 3 Out of 9

er of Assumed Values = 3 Out of 9

ercentage of Assumed Values - 33's

Site Clasure

ertace Flows

OVERALL SCORE

0

30

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Meste Characteristics Subscore X 0.24 plus Meste Mensoement Subscore X 0.24)

(Factor Score Divided by Maxim Score and Multiplied by 100)

.

7

SURTOTALS

SUBSCORE

Site No. 37 - Fuel	Spill			
Location Power House -LIZ-3	Ophi			
Owner/Operator LIZ-3				
RATING FACTOR RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPTORS RECEPT				
	4000 g	6//ons	LIER SCORE 4 0 12 0 12 6 34 Builtiplied by Na Multiplied by 100	
reconerpa				
	73C708			MAXIMIN
210000 00000		MIT PTO TOO	•	POSSESLE
	1	4	4	12
Distance to Hearnet	^		^	, / 5
Drighting Water Wall	<u> </u>		0	47
Distance to Reservation Boundary	2	6	12	18
Last Use/Zoning	^	3		9
<u> </u>	Ī	· 12	12	36
Mater Caslity of Mearby				10
Surface Mater Body ASSUMED				<u>/ </u>
· · · · · · · · · · · · · · · · · · ·			_34_	138
			vided by N	<u> </u>
				
	·			
PATHAXI				
vidence of Weter Contamination	0	10	0	30
evel of Mazer Contemination Acsumed	1	15	15	45
		5		16
ASSumeu				15
istance to Hearest Surface Water	<u>2 </u>	····	<u> </u>	12
epth to Groundwitter	3	7	21	21
et Precipitation	1	6		18
oil Permeebility ASSII as a d		6		10
oil Permonbility ASSUMED			<u> </u>	_ / <u>Y</u> _
ndrock Permeshility N/A		4		
mpth to Bedrock N / A		4		_
urface Erosion	1	4	4	12
water of Assumed Values - 3 Out of 10			65	177
humber of Assumed Values . Out of 10	34	BIOTALS	_07	. 441

Percentage of Assumed Values = 30 %
Humber of Missing Values = 2 Out of 10

Percentage of Missing Values - 20.

(Factor Score Divided by Maxim Score and Maltiplied by 100)

				Siti	<u>e No.</u>	<u>37</u>
	g: Judgemental sati	ing from 30 to 100 points h	need on the fa	llowing quidolin	46. ;	
9 554 . 30	Classi densities two	e landfill, old site, no km	nm hazardene	metas		
40						
50						
60	•					
70	•		tes			
80	•	•				
9 0	•					
00	• • •					
						-
Reason for A		eine:	SURE CORE	:	_5	o
	Fue	Spill		·		
						
		WASTE PRINCES	ENT PRACTICES			
			FACTOR			MAXINUM
RATING	PACTOR		RATING (0-3)	MULTIPLIER	FACTOR	POSSIBLE SCORE
	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	·		
	Closed dementiar-type landfill, old site, to known hazardone wastes Closed dementiar-type landfill, resent site, no known hazardone wastes Supposed mall quantities of hazardone wastes Elemen shall quantities of hazardone wastes Elemen sedurate quantities of hazardone wastes Elemen large quantities of hazardone wastes Elemen sedurate properties for the sedurate sesses Elemen sedurate properties for the sedurate sesses Elemen sedurate for hazardone sesses Elemen sedurate for the sedurate for the sedurate sesses Elemen sedurate for the sesses Elemen sedurate for the sedurate sesses Elemen sedur					
Reservous V	earte Quantity	Assumed	0	7	0	21
Total Waste	Quantity	Assumed	0	4	0	12
Maste Incom	pecibility	Assumed	0	3	0	9
				6	6_	/8
	•	N) A	_	6		
Use of Gas Collection	Systems	NIA	. ,	2		
Closed demostic-type landfill, old site, so known bazardose wastes Closed demostic-type landfill, resent site, so known bazardose wastes Closed demostic-type landfill, resent site, so known bazardose wastes Closed demostic-type landfill, resent site, so known bazardose wastes Closed demostic quantities of bazardose wastes Closed demostic dem						
Subsurface	Flore			7	_7_	21
				SUSTOTALS	_/3_	8/
		/L	•	_	Name days be	16
			,			
Overall Per	Legitage of Assembly value	Values - 32	OVERALL SC	ORE .		<u> 33 </u>
/						

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Neste Characteristics Subscore X 0.24 plus Meste Management Subscore X 0.24)

Name of Site Site No 38 - Cultoseries South of Site -L Commer/Operator LTZ-3 Commer Site is in excellent	rrent Du IZ-3 condition		· · · · · ·	ined
BATING PACTOR	FACTOR RATING (0-3)	MULTIPLIER	PACTUR SCORE	HAZZHEN PORSZRIZ SCORZ
, IOCIPT	ORS			
Population Within 1,000 Feet	0	4	0	12
Distance to Mearest Orinking Water Well	\Diamond	15	0	45
Distance to Meservation Boundary	a	•	12	18
Land Use/Zoning	0	3	-12	9
Critical Environments		- 12	12	36
Hater Quality of Hearby Surface Water Body A SSUMPO	1	6	6	18
Amber of Assumed Values =Out of 6	\$1	PTOTALS	_30_	138
Percentage of Assumed Values = $\frac{17}{0}$ \ Mumber of Missing Values = $\frac{1}{0}$ Out of 6 Percentage of Missing Values = $\frac{1}{0}$ \	SUBSCORE Divided by Maximum Score and Multiplied by 100)			

Pathigys				
Evidence of Water Contamination	0	10	0	3D
Level of Water Contamination Assumed	0	15	0	45
Type of Contamination, Soil/Biota ASSUMED	0	5	0	15
Distance to Hearnst Surface Water	2	4	8	12
Depth to Groundwater	3	7	21	21
Net Precipitation		6	6	18
soil Permontility Assumed	1	. 6	6	18
Pedrock Permeability N/A		4		
Depth to Sedrock		. 4		
Surface Erosion		4	4	12
Number of Assumed Values * 3 Out of 10		SUPTOTALS	45	171
Percentage of Assumed Values - 301		SURSCORE		26
Number of Missing Values - 2 Out of 10 Percentage of Missing Values - 20	(Factor Score Divided by Maximum Score and Multiplied by 100)			

	WASTE CHARACTERISTICS	Site No. 38
Notordone I	lating: Judgemental rating from 30 to 100 paints based on ti	ne following guidelines:
Points		
30	Closed demostis-type landfill, old site, no known hazard	laus vastes .
40	Closed demostic type landfill, recent site, no known has	tacdous vastes
50	Suspected small quantities of hazardous wastes	•
60	Rooms small quantities of hemoretous wastes	
70	Suspected moderate quantifies of hazardous vestes	
80	Known moderate quantites of hazardous wastes	
90	Suspected large quantities of hazardous vestes	
100	Known large quantities of hazardous wastes	
	Ştib	100E 50
heesen fo	Some aumping of haz	ardous
	materials Could occur	urgaus
	The state of the s	

WARTE HANGEMENT PRACTICES

RATING FACTOR	FACTOR RATING (0-3)	MULTIPLIER	FACTOR SCORE	HAZZMEN POSSIBLE SCORE
Record Accuracy and Ease of Access to Site	3	7	21	 સ્રા
Managedous Maste Quantity ASSUMED	0	7	0	21
Total Marte Quantity ASSUMPO	0	4	0	12
Maste Incompatibility ASSUMED	0	. 3	0	9
Absence of Liners or Confining Bods		6	6	18
Use of Leachate Callection System	3	6	18	18
Use of Gag Collection Systems	3	2	6	6
Elte Closure N./ A				
Substitute Flore	0	7	0	21
Number of Assumed Values = 3 Out of 9 Percentage of Assumed Values = 32		SUBSCORE	_5L	<u>150</u> 34
Number of Missing and Mon-Applicable Values =Out of 9 (Factor Score Div Score and Multiple Score and Multiple				
Overall Number of Assumed Values = $\frac{7}{28}$ Out of 25 Overall Percentage of Assumed Values = $\frac{28}{28}$	OVERALL S	CORE & Subscore X 0.22	plus	33

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Maste Characteristics Subscore X 0.24 plus Maste Management Subscore X 0.24)

man of size Site No. 39 - Old	Dump	Site -	SOUTI	4
constine ~ 2 miles south of	site	LIZ-3		
come This site was cleared	L-UP	in 197	9-80	
	FACTOR NATING		PACTOR	MAKIMIN POSSIBLE
RATING PACTOR	(0-3)	HULTIPLIER	SCORE	SCORE
RECEPTORS				<u> </u>
Population Within 1,000 Feet	0	4	0	12
Distance to Mearest Drinking Maser Hell	0	15	0	45
Distance to Reservation Boundary	3_	4	18	18
Land Use/Zoning	0	3	0	9
Critical Environments		- 12	12	36
Mater Quality of Hearby Surface Water Body Assumed		•	6_	18
Number of Assumed ValuesOur of 6	s	PROTALS	_36	138
Percentage of Assumed Values = 17	_	JRECORE		<u> 26</u>
mber of Missing Values = Out of 6 (Factor Score Divided by Maximum Score and Multiplied by 100)				
PATINGAYS	<u> </u>			··· <u>·</u>
	<u>·</u>	10	0	30
		10	0	<u>30</u> 45
Evidence of Water Contamination	 			30 45 15
Evidence of Water Contemination Level of Water Contemination ASSUMED Type of Contemination, Soil/Biota ASSUMED	 	15		30 45 15 12
Evidence of Water Contemination Level of Water Contemination ASSUMED Type of Contemination, Soil/Biota ASSUMED	1 1 1 3 3	15		30 45 15 12 21
Evidence of Water Contemination Level of Mater Contemination ASSUMED Type of Contemination, Soil/Biota ASSUMED Distance to Mearest Surface Water		15	0	45 15 12
Evidence of Mater Contamination Level of Mater Contamination ASSUMED Type of Contamination, Soil/Biota ASSUMED Distance to Measure Surface Mater Depth to Groundwater Not Presipitation		15 5 4 7	0 0 12 21	45 15 12 21
Evidence of Mater Contamination Level of Mater Contamination ASSUMED Type of Contamination, Soil/Biota Distance to Mearest Surface Mater Depth to Groundwater Net Presipitation	3	15 5 4 7	0 0 12 21 6	45 15 12 21
Evidence of Mater Contemination Level of Mater Contemination ASSUMED Type of Contemination, Soil/Biota ASSUMED Distance to Measure Surface Mater Depth to Groundwater Not Presipitation Soil Permosbility ASSUMED	3	15 5 4 7 6	0 0 12 21 6	45 15 12 21
Evidence of Mater Contemination Level of Mater Contemination ASSUMED Type of Contemination, Soil/Biota ASSUMED Distance to Measure Surface Mater Depth to Groundwater Not Presipitation Soil Permeability ASSUMED Dedrock Permeability N/A	3	15 5 4 7 6 6	0 0 12 21 6 6 -	45 15 12 21
Evidence of Mater Contemination Level of Mater Contemination Type of Contemination, Soil/Biota ASSUMED Distance to Measure Surface Mater Depth to Groundwater Net Presipitation Soil Permeability ASSUMED Bedrock Permeability N/A Depth to Bedrock N/A Surface Evosion Number of Assumed Values = 3 Out of 10	3 1 1 1	15 5 4 7 6 6 4 4 4	0 0 12 21 6	45 15 12 21
Evidence of Mater Contamination Level of Mater Contamination ASSUMED Type of Contamination, Soil/Biota ASSUMED Distance to Measure Surface Mater Depth to Groundwater Net Presipitation Soil Permeability ASSUMED Depth to Surface Moder N/A Depth to Surface Evocion	3 1 1	15 5 4 7 6 6 4 4	0 0 12 21 6 6 - 4 4 9	45 15 12 21 18 18 - 12 171 21

	WASTE CHARACTERISTICS	Site	No.	39
leserdoue	Rating: Judgemental rating from 30 to 100 points based on the	following guidel	ines	
Polata				
30	Closed demostic-type landfill, old site, no known hezardou	s vastas	•	
40	Classed demostis-type landfill, recent site, no known hazar	dous vastes		
50	Suspected small quantities of hassardone wester	•		
60	Enouge small quantities of hagestone vartes			-
70	Suspected medicate quantifies of heserdous vastes			
80	Ranna andersta quantities of hazardous wastes			
90	Suspected large quantities of hazardous wastes			
100	Known large quantities of hazardous wastes			
				50
heaven :	Old dump site received a generated by site	11 wast	ρ	
	generated by site			
	J			

WASTE HANGERENT PRACTICES

RATING FACTOR	FACTOR NATING (0-3)	HULSTPLIER	FACTOR SCORE	MAKEMEN POSSIBLE SCORE
Record Accuracy and Ease of Access to Site	3	7	21	21
Hassardons Waste Quantity Assumed	0	7	0	21
Total Marte Quantity ASSUMED	Ó	4	0	12
Maste Incompatibility ASSUME d		. 3	3	9
Absence of Liners or Confining Beds		6	6	18
Use of Leachete Callection System	3	6	18	18
One of Gas Callection Systems	3	2	6	6
Site Clasure .	0	•	O	24
Subserface Flows	1	7	7	21
Number of Assumed Values = 3 Out of 9 Percentage of Assumed Values = 33 1		SUBSCORE	61	150 41
Number of Hissing and Hon-Applicable Values = Out of 9 Percentage of Hissing and Hon-Applicable Values = 01		(Factor Score Score and Mult		
Overall Number of Assumed Values = 7 Out of 25 Overall Persontage of Assumed Values = 88	OVERALL S	ICORE		36
•	Pathways	rs Subscore X 0.22 Subscore X 0.30 p practeristics Subs	lus	74 plus

S'1 AL 1/0 - 0	1	0 . 0		
	CENI	Dump S	170	
Behind Hangar - LIZ.	<u></u>			
Commerce Waste Which Cannot	be	incinera	+PM	
والمراقب	illage		nt Lau	
and Alaska Internation			on	
Dumn Here		-		
,	PACTOR			MAXIMU
SATING PACTOR	rating (0-3)	MULTIPLIER	FACTOR	POESTRUE SCORE
ACTION ACTION				
				
Population Within	\bigcirc	4	\triangle	12
Distance to Nearest				
Drinking Water Well	0	15	0	45
Distance to Reservation	^		1.00	10
Boundary	_3_	<u> </u>	18	18
Land Use/Zoning	0	3	0_	<u>9</u>
Critical Environments	L	. 12	12	36
Natur Quality of Hearby Surface Water Body A 554med	1	6	6	18
Number of Assumed Values = Out of 6		ZJATOTELS	36	138
Percentage of Assumed Values = 17	:	SURSCORE		38
Number of Missing Values - O Out of 6		(Factor Score Di		
Percentage of Missing Values\		Score and Multip	1795 ph 100	••
PATHOLYS				
Evidence of Water Contamination	2	10	20	30
Level of Mater Contamination ASSUMED	1	15	15	45
Type of Contamination, Soil/Biota Assumed	1	5	5	15
Distance to Mearest Surface Water	3	4	12	12
Depth to Groundwater	_3	7	21	21
Net Precipitation	1	6	6	18
Soil Personability Assumed		6	6	18
Sedrock Personality N/A		4	<u></u>	
Depth to Bedrock N/A		4		
Surface Erotion	1	4	_4_	12
Number of Assumed Values = 3 Out of 10		FUSTOTALS	<u>89</u>	171
Percentage of Assumed Values = 30	1	SURSCORE		
· •				
Number of Missing Values = 2 Out of 10 Percentage of Missing Values = 20		(Pactor Score Div Score and Multip		

	MASTE CHANCTERISTICS Site No. 40
He sardous	Rating: Judgemental rating from 30 to 100 points based on the following guidelines:
<u>Points</u>	
30	Closed demostis-type landfill, old size, no known hazardous wastes .
40	Closed demostic type landfill, resont site. no known hazardous wastes
50	Supported small quantities of hazzardous westes
60	There shall quantities of hazardove vastes
70	Suspected mederate quantifies of hazardous wantes
80	Rnown moderate quantities of hexardous wherea
90	Suspected large quantities of heserdous vertes
100	Xnown large quantities of bazardous wastes
Noteon :	Cor Assigned Respectous Recing: 50 Uncontrolled dumping by others
	, , , ,

MASTE HANGEHENT PRACTICES

RATING FACTOR	FACTOR BATTING (0-3)	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
Record Accuracy and Page of Access to Size	3	7 .	21	21
Resardous Weste Quantity	0	7	0	21
Total Maste Quantity	0	4	0	12
Maste Incompatibility ASSUMED	0	3	0	9
Absence of Liners or Confining Bods	3	6	18	18
Use of Leachste Collection System	3	6	18	18
Use of Gas Callection Systems	. 3	2	6	6
Rite Closure N/A		•		
Subsurface Flore		7	7	21
Number of Assumed Values = Out of 9 Percentage of Assumed Values =1		SUBSCORE	70	/26 56
Rember of Missing and Mon-Applicable Values = Out o Percentage of Missing and Mon-Applicable Values = \	of 9 (Factor Score Divided by Maxim Score and Multiplied by 100)			
Overall Number of Assumed Values = 5 Out of 25 Overall Percentage of Assumed Values = 20 4	OVERALL S	CORE		48
,	Pathways	s Subscore X 0.22 Subscore X 0.30 p racteristics Subs	lus	24 plus

Name of Size Site No. 43 Old LOCATION North of Site - LIZ OWNER/OPERATOR LIZ-2	Dump -2	Site		
come Old site, Cleaned up	In 19	79-80		
RATING PACTOR	FACTOR BATING (0-3)	MILTIPLIER	PACTOR SCORE	HAZZHUH POESTALE SCORE
RECEPTORS				
Population Within 1,000 Feet	2	4	8	12
Distance to Nearest Drinking water Well	0	15	_6	45
Distance to Reservation Boundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments	1	- 12	12	36
Surface Water Body ASSUM Pd	1	6	6	18
Number of Assumed Values =Ost of 6 Percentage of Assumed Values =0 Mumber of Missing Values =0 Percentage of Missing Values =0	SUBTOTALS SUBSCORE (Pactor Score Divided by HER Score and Multiplied by 100)			
PATHWAYS	·			
Evidence of Water Concemination	O	10	0	30
Level of Mater Contamination ASSUMPd		15	15	<u>45</u>
Type of Contamination, Soil/Biota ASSUMED		5	_5	<u>/5</u>
Distance to Mearest Surface Water	3	4	12	12
Depth to Groundwater	3	7	21	21
Net Precipitation	1	6	6	/ §
soil Permeability Assumed	1 -	6	6	18
Pedrock Personability N/A		4		
Depth to Bedrock		4	<u> </u>	
Surface Erosion	1	4	1 1	17
Number of Assumed Values = 3 Out of 10			- 69	

(Pactor Score Divided by Maximum Score and Multiplied by 100)

Number of Missing Values - 2 Out of 10

Percentage of Missing Values - 20.

	Site No. 43							
Noverdous I								
Points								
30	Closed demostic-type landfill, old site. so known hazardous wastes							
40	Closed demostic type landfill, recent site. No known hexardous wastes							
50	50 Suspected small quantities of hassidous wester							
60 Khown shall quantities of hazardous wastes								
70	Suspected enderate quantities of hexardous wastes							
80	Rapus moderate quantitos of hazardous vestos							
90	Suspected large quantities of hazardous wastes							
100	Known large quantities of hazardous westes							
Region fo	Site Received All Waste prior to 1973							

WASTE HANGEMENT PRACTICES

RATING FACTOR	PAC WAT (0-	ENG	FACTOR LIER SCORE	POSSIBLE SCORE
Record Accuracy and			0.1	
Ease of Acress to Site		, ,	21	
Reservious Maste Quantity ASSUME	ed C	7	0	<u>21</u>
Total Meste Quantity ASSUM	od 1	4	4	12
Waste Incompatibility ASSUM		3	0	9
Absence of Liners or Confining Beds		6	6	18
Use of Leachets Callection System	· 3	6	18	18
Day of Gas Cellection Systems		3 2	6	6
Site Closure .	3	8	24	24
Subsurface Flows		7	7	21
Number of Assumed Values = 3 Out of 9		SUSTOTAL	86	
Purcentage of Assumed Values = 32	\wedge	SUBSCORE		57
Rember of Missing and Mon-Applicable Values *	\sim		leare Divided b Multiplied by	
Percentage of Missing and Mon-Applicable Values	· • <u>/ / ·</u>			

Overall Number of Assumed Values = ______ Out of 25 Overall Percentage of Assumed Values = _______ 25°

OVERALL SCORE

45

(Receptors Subscore X 0.22 plus Pathways Subscore X 0.30 plus Neste Characteristics Subscore X 0.24 plus Meste Management Subscore X 0.24]

WASTE DISPOSAL SITE AND SPILL AREA ASSESSMENT AND RATING FORM

Name of Size Site No. 44 Sus	pected	Dum	n Sity	ρ
LOCALION North of Site LI	2-2			<u> </u>
OMER/OPERATOR VIllage of Pt. Lay	 -			
Identified from Inte	erviews			
RATING PACTOR	FACTOR SATING (0-3)	HULTIPLIE	FACTOR SCORE	Harinen Possible Score
RECEPTORS				
Population Within 1,000 Feet	2	4	8	12
Distance to Nearest Drinking Water Well	0	15	0	45
Distance to Reservation Soundary	3	6	18	18
Land Use/Zoning	0	3	0	9
Critical Environments		- 12	12	36
Surface Mater Body ASSUMED		6	6	18
Number of Assumed Values =Out of 6		BTOTALS	44	138
Percentage of Assumed Values = \ Number of Missing Values = Out of 6		BSCORE Betor Score (Sivided by M	32
Percentage of Hissing Values - O	· Se	ore and Hulti	iplied by 10	0)
	- 			
PATMAYS	·			
Ovidence of Water Contamination	0	10	0	30
avel of Mater Contamination Assumed		15	15	45
Type of Contamination. Soil/Biota ASSumed	1	5	5	15
Distance to Negrest Surface Mater	3	4	12	12
Depth to Groundwater	3	7	21	21
let Precipitation	1	6	6	18
Potts Pottsebility Assumed	1.	6	6	18
Nedrock Permeability N/A		4	_	
Repth to Redrock //A		4		
kerface Erosian	1	4	4	12
tumber of Assumed Values = 3 Out of 10		ITOTALS	69	171
reconcage of Assumed Values = 30 %		ISCORE Metor Score D	ivided by M	_

Percentage of Missing Values - 201

	Site No. 44
le serdoye	Nating: Judgemental rating from 30 to 100 points based on the following guidelines:
Points	
30	Closed demostis-type landfill, old site, no known hezardous wastes
40	Closed demestir-type landfill, recent site, no known hazardous wastes
Sq	Sespected small quantities of hazardons wastes
60	Recove small quantities of heserdous vegtes
70	Suspected moderate quantifies of hazardous westes
80	Rapun moderate quantities of hazardous vestes
90	Suspected large quantities of hazardous wastes
100	Known large quantities of hazardous wastes
Page 100	for Assigned Hazardous Racing:
	If confirmed, site probably received uncontrolled waste

WASTE HANGEDERY PRACTICES

WATE MANGEREN	PRICTICES					
BRIDE FACTOR	FACTOR NATING (0-1)	MULTIPLIER	FACTOR SCORE	HAZZHUM POBSIBLE SCORE		
Record Accuracy and Ease of Access to Site	3	7	21	21		
Reservious Meets Quantity ASSUMED	0	7	0	21		
Total Maste Quantity ASSUMED		4	4	12		
Maste Incompatibility ASSUMED	0	3	0	9		
Absence of Liners or Confining Bads	L	6	6	18		
Use of Laschate Collection System	3	6	18	18		
Doe of Gas Collection Systems	3	2	6	6		
Site Closure	3	1	24	24		
Subsurface Flows	1	7	7	21		
Number of Assumed Values = 3 Out of 9 Percentage of Assumed Values = 33 1 Rember of Missing and Mon-Applicable Values = 0 Out of 9 Percentage of Missing and Mon-Applicable Values = 0 1		SUBSCORE (Factor Score Score and Mult				
Overall Number of Assumed Values - 7 Out of 25 Overall Percentage of Assumed Values - 28	Pathways Maste Cha	CORE Subscore X 0.30 ; Subscore X 0.30 ; racteristics Subscore	olus e coro X 0.1	45		

2

INSTALLATION RESTORATION PROGRAM RECORDS SEARCH

HAZARD ASSESSMENT RATING METHODOLOGY FOR ALASKA DEW LINE STATIONS

Prepared for

Air Force Engineering and Services Center Directorate of Environmental Planning Tyndall Air Force Base, Florida 32403

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June 1982 Contract No. FO863780 G0010 0015 Appendix G
NEW HAZARDOUS ASSESSMENT RATING METHODOLOGY

USAF INSTALLATION RESTORATION PROGRAM HAZARD ASSESSMENT RATING METHODOLOGY

BACKGROUND

The Department of Defense (DOD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DOD facilities. One of the actions required under this program is to:

"develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts." (Reference: DEOPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

The first site rating model was developed in June 1981 at a meeting with representatives from USAF Occupational Environmental Health Laboratory (OEHL), Air Force Engineering Services Center (AFESC), Engineering-Science (ES) and CH₂M Hill. The basis for this model was a system developed for EPA by JRB Associates of McLean, Virginia. The JRB model was modified to meet Air Force needs.

After using this model for 6 months at over 20 Air Force installations, certain inadequacies became apparent. Therefore, on January 26 and 27, 1982, representatives of USAF CEHL, AFESC, various major commands. Engineering Science, and CH₂M Hill met to address the inadequacies. The result of the meeting was a new site rating model designed to present a better picture of the hazards posed by sites at Air Force installations. The new rating model described in this presentation is referred to as the Hazard Assessment Rating Methodology.

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air Force in setting priorities for follow—on site investigations and confirmation work under Phase II of IRP.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DOD program needs.

The model uses data readily obtained during the Record Search portion (Phase I) of the IRP. Scoring judgments and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards at the site. This approach meshes well with the policy for evaluating and setting restrictions on excess DOD properties.

Site scores are developed using the appropriate ranking factors according to the method presented in the flow chart (Figure 1). The site rating form is provided in Figure 2 and the rating factor guidelines are provided in Table 1.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: the possible receptors of the contamination the waste and its characteristics, potential pathways for waste contaminant migration, and any efforts to contain the contaminants. Each of these categories contains a number of rating factors that are used in the overall hazard rating.

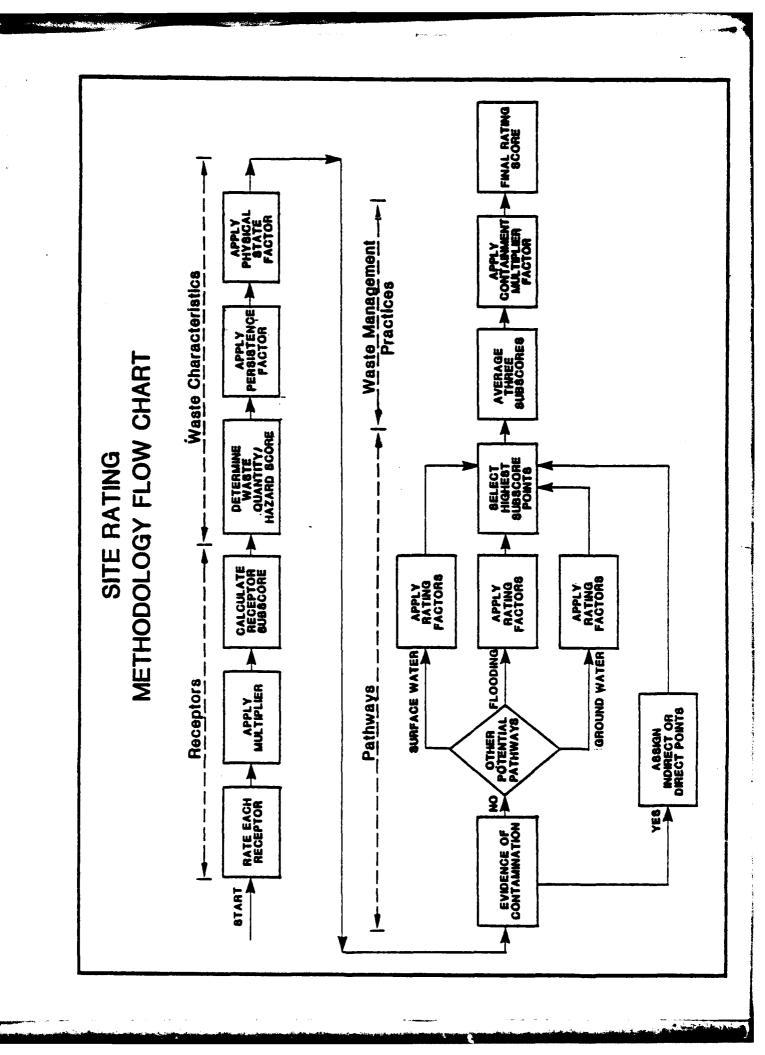
The receptors category rating is calculated by scoring each factor, multiplying by a factor weighting constant and adding the weighted scores to obtain a total category score.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned and for direct evidence 100 points are assigned. If no evidence is found, the highest score among three possible routes is used. These routes are surface water migration, flooding, and ground-water migration. Evaluation of each route involves factors associated with the particular migration route. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The waste characteristics category is scored in three steps.

First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The scores for each of the three categories are then added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Sites at which there is no containment are not reduced in score. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factor to the sum of the scores for the other three categories.



Page 1 of 1

NAME OF SITE		<u> </u>		
DATE OF OPERATION OR OCCURRENCE				<u> </u>
CHREEK/OPERATOR				
CONSCIENTS/DESCRIPTION				
SITE MATED BY				
L RECEPTORS		•		
	Pactor Rating		Factor	Hestina Possib
Rating Factor	(0-3)	Multiplier	Score	Scor
A. Population within 1,000 feet of site		4		
3. Distance to mearest well		10		
C. Land use/moning within 1 mile radius		3		
D. Distance to reservation boundary		6		
E. Critical environments within 1 mile radius of site		10		
<u> </u>				
P. Water quality of nearest surface water body		6	<u> </u>	
G. Ground water use of uppermost aquifer		9	<u> </u>	_
Ropulation served by surface water supply within 3 miles downstream of site -		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals		
Receptors subscore (100 % factor	score subtotal	/maximum score	subtotal)	
IL WASTE CHARACTERISTICS				
A. Select the factor score based on the estimated quant the information.	ity, the degre	e of hazard, a	nd the confi	dence lev
1. Waste quantity (S = small, M = medium, L = large	.)			
2. Confidence Level (C = confirmed, S = suspected)				-
•				
 Hazard rating (H = high, H = medium, L = low) 				
Factor Subscore A (from 20 to 100 bas	ed on factor :	core matrix)		
3. Apply persistence factor			•	
Factor Subscore & I Persistence Factor - Subscore B				
x				
C. Apply physical state multiplier				
Subscore 3 X Physical State Multiplier - Waste Chara	cteristics Su	pecore		
xx				

M. PATHWAYS

1980								
			Pactor Rating		Pactor	Maximum Possible		
	Rati	ing Pactor	(0-3)	Multiplier		Score		
λ.	di	there is evidence of migration of hazardous con sect evidence or 80 points for indirect evidence idence or indirect evidence exists, proceed to 8	. If direct ev					
		•						
8.		te the migration potential for 3 potential pathw gration. Select the highest rating, and proceed		eter migration	n, flooding, a	nd ground-weter		
	1.	Surface veter migration				•		
		Distance to mearest surface veter	-	8				
		Net precipitation		6				
		Surface erosion		8				
		Surface permeability		6		 		
		Rainfall intensity		8		<u> </u>		
			•	Subtota	<u> </u>			
		Subscore (100 % facto	c score subtota	l/maximum sco	re subtotal)	. 		
	2.	Flooding		1				
	Subscore (100 x factor score/3)							
	3.	Ground-water migration	•					
		Depth to ground water		8				
		Net orecipitation		6				
		Soil permeability	·	8				
		Subsurface flows		A 8				
		Direct access to ground water		8				
				Subtota	le			
		Subscore (100 x facto	x score subtota	1/maximum sco	re subtotal)			
c.	H1	ghest pathway subscore.						
	En	ter the highest subscore value from A, 3-1, 8-2	or B-3 above.					
				Pathw	eys Subscore			
IV	. V	VASTE MANAGEMENT PRACTICES		 ,				
λ.	λv	erage the three subscores for receptors, waste	maracteristics,	and pathways	•			
		1	ceptors ste Characterist	·i ne				
			rpada rpada					
		Tot	tal	divided by 3		oss Total Score		
3.	λτ	ply factor for waste containment from waste man	gement practice	HS				
		ross Total Score X Waste Management Practices Pa						
				_ x				

TABLE 1

HAZARDOUS ASSESSMENT RATING METHO

		Multiplier		9 ,	, v		<u>.</u>	v a	•	va	•
Lines		Greater than 100	0 400 % 04 0		Residential		dangered or threatened Species; presence of Focherge area; major Wetlands.	Potable water supplies	Drinking water, no muni- ofpal water available; commercial, industrias,	Water source available. Greater than 1,000	Gester than 1, 000
SOURCE SOURCE METHODOLOGY GUIDELINES		26 - 100	3,001 feet to 1 mile	1,001 feat to 1 mile	Commercial or Industrial	Printine natural	Aceas minor wet- lands; preserved Areas; presence of economically impor- Eant natural re- Bources susceptible to contamination.	Shellfish propaga- tion and harvesting.	Drinking water, D municipal water o available,	51 - 1,000 GC	51 - 1,000 GC
oo booment RATING	Hating Scale Levels	1 - 25	es) to 3 miles	es ito 2 miles	Agrićultural able)	Matural areas		Recreation, propagation and management of fish and	Commercial, in- dustrial, or irrigation, very limited other	1 - 50	9 - 6
	0	o	Geater than 3 miles	Greater than 2 miles	Completely remote A	Not a critical environment	·	Agricultural or Industrial use.	NO: used, other Sources readily available.	9	a
I. RECEPTONS CATEGORY		A: Population within 1,000 feet (includes on-base facilities)	B. Distance to mearest water well	C. Distance to installation boundary	inile radius) R. Criston	(within mile radius)	F. Water quality/use	designation of nearest surface water body	G. Ground-Water use of uppermost aquifer	H. Population served by Burface water supplies within 3 miles down- atream of mite	 Population served by Aquifer Aupplies within 3 miles of site

TABLE 1 (Continued)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

WASTE CHARACTERISTICS =

Hazardous Waste Quantity A-1

B=Baall quantity (5 tons or 20 drums of liquid) H=Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid) L=Large quantity (20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

o Verbal reports from interviewer (at least 2) or written information from the records.

reports and no written information from o No verbal reports or conflicting verbal the records.

B - Buspected confidence level

o Knowledge of types and quantities of wastes generated by shops and other areas on base.

o Based on the above, a determination of the types and quantities of waste disposed of at the aite.

quantities of hazardous wastes generated at the o Logic based on a knowledge of the types and base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site.

A-3 Hazard Rating

		Rating Scale Levels	61.6	
Hazard Category	0		3	3
Toxicity	San's Level O	San's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200°F	Flash point at 140°F to 200°F	Flash point at 80°P to 140°P	Flash point at 80°F Flash point less than to 140°F
Radioactivity	At or below background levels	i to 3 times back- ground levels	3 to 5 times back- ground levels	Over 5 times back- ground levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Points	e 4 -
Hazard Rating	High (H) Medium (M) Low (L)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDBLINES (Cont'd)

II. MASTE CHARACTERISTICS (Continued)

Waste Characteristics Matrix

Hazard Rating	3	X #	=	= z	*===	==-1	442	
Confidence Lavel of Information	ပ	ပပ	æ	o o	ത ധ മ ധ	ன கை பக	റ മ മ	82
Hazardous Waste Quantity	.i	u Z	1	68 2	7 7 Z Ø	# Z Z	wa z wa	83
Point Rating	100	9	02	9	20	07	R	2

o Wastes with the same hazard rating can be added o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM dealgnation (60 points). By adding the guantities of each waste, the dealgnation may change to LCM (60 points). In this case, the correct point rating for the waste is 80.

Por a site with more than one hexardous waste, the waste quantities may be added using the following rules:

Confidence Level

o Confirmed confidence levels (C) can be added o Buspected confidence levels (8) can be added o Confirmed confidence levels cannot be added with suspected confidence levels

Waste Hazard Rating

B. Persistence Multiplier for Point Rating

Multiply Point Rating From Part A by the Pollowing	0.1	99
Persistence Criteria	Metals, polyoyolio compounds, and halogenated hydrocarbons Substituted and other ring	compounds Straight chain hydrocarbons Easily blodegradable compounds

C. Physical State Multiplier

Multiply Point Total From Parts A and B by the Polloving	1.0 0.75 0.50
Physical State	Liquid Bludge Bolid

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

III. PATHIMYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface vater, ground water, or air. Evidence should confirm that the source of contamination is the site being

Indirect evidence might be from visual observation (1.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 POTENTIAL FOR SURPACE MATER CONTAMINATION

Rating Pactor	0	Hating Scale Levels	evels		
Distance to marest surface water (includes drainage ditches and storm severs)	e Greater than 1 mile	2,001 feet to 1	501 feet to 2,000 feet	0 to 500 feet	Multiplier
Met precipitation	Less than -10 in.	-10 to + 5 In.	**************************************		
Surface erosion	None	Bilght	10 to 440 10.	Greater than +20 in.	•
Burface permeability	01 to 15t clay (>10 cm/sec)	154 to 301 clay	156 to 308 clay 300 to 505 clay		a 4
Rainfall intensity based on I year 24-hr rainfall	<1.0 inch	1.0-2.0 inches	3.1-3.0 inches	(<10 cm/sec)	•
B-2 POTRNTIAL FOR PLOODING					•
Floodplain	Beyond 100-year floodplain	In 25-year flood- plain	In 10-year flood-	Floods annually	~
8-3 FOTISTIAL FOR CROUND-MATER	R CONTAMINATION				
Depth to ground water	Greater than 500 ft	50 to 500 feet			
Met precipitation	Less than -10 in.	-10 to +5 in	T to so test	O to 10 feet	•
Soil permesbility	Greater than 508 clay (>10 cm/sec)	30 to 50 clay 136 to 30 clay	13 to 120 in.	Greater than +20 in.	•
Subsurface flows	Bottom of site great- er than 5 feet above high ground-water level		Bottom of wite frequently sub-	(<10 daysed) Bottom of alte lo- cated below mean	• •
Direct access to ground state (through faults, factures, faulty well casters.	-		merged Woderate riak	ground-vater level Migh risk	•

TABLE 1 (Continued)

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES (Cont'd)

IV. MASTE MANACEMENT PRACTICES CATEGORY

This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores. ÷

B. WASTE MANAGEMENT PRACTICES PACTOR

The following multipliers are then applied to the total risk points (from A);

Maltiplier	1.0 0.95 0.10		Burface Ispoundaents:	o Linera in good condition	o Bound dikes and adequate freeboard	o Adequate monitoring wells		Fire Proection Training Areas:	o Conorate surface and berms	Oll/water separator for pretreatment of tunoff	Effluent from oil/water separator to treatment plant
Waste Management Practice	No containment Limited containment Fully contained and in full compliance	Guidelines for fully contained:	Landfills:	o Clay cap or other impermeable cover	o Leachate collection system o	b Liners in good condition	o Adequate monitoring wells	Spille	o Quick apill cleanup action taken	o Contaminated soil removed	o Soil and/or water mamping confirm total cleanup of the spill

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-? or III-B-3, then leave blank for calculation of factor score and maximum possible score.

Appendix H NEW SITE RATING FORMS

Table 1 SUMMARY OF RESULTS OF SITE ASSESSMENTS

						·
Overall Score (Sum of Subscores/3)	52 63 63 44	.,,	39	51 51 41	41 48 39 38	41 41 41
Subscores ble Score in Each Category) ys Waste Characteristics	80 80 50 80 50	• 05	50	48 80 50 50	80 50 50	50 50 50
Subs Receptors Pathways	28 56 28 80 28 56 28 80 28 60	19 48	24 . 48	24 80 24 48 24 48 24 48	21 42 19 48 22 48	22 51 27 51 27 51
Site No. Site Description BAR-M	1 Old Dump Site 3 Waste POL Pond 4 Current Dump Site 8 Contaminated Drainage Cut 9 Old Pump SiteN.W.	13 Old Dump SiteEast POW-2	16 Old Dump SiteN.W.	28 POL Storage Area 29 Diesel Fuel Spill 31 Old Dump Lagoon Site 32 Husky Dump Site	37 Diesel Fuel Spills 38 Current Dump Site 39 Old Dump SiteSouth	Current Dump Site Old Dump Site Suspected Dump Site
		н -		ül	3	44 44 44

Page 1 of 2

NAME OF SITE:

No. 1, 01d Dump Site

LOCATION:

BAR-M

DATE OF OPERATION OR OCCURRENCE: 1956 to 1978

OWNER/OPERATOR: BAR-M

COMMENTS/DESCRIPTION: Received all wastes, including POL waste from site

SITE RATED BY: G. McIntyre

1. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
٤.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	2	6	12	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	50	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		28

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1	. Waste quantity (S = small, M = medium, L = large)	M
2	. Confidence level (C = confirmed, S = suspected)	С
3	. Hazard rating (H = high, M = medium, L = low)	Н
F	actor Subscore A (from 20 to 100 based on factor score matrix)	80

B. Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $80 \times 1.0 = 80$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

$$80 \times 1.0 = 80$$

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
	If there is evidence of migration of hazardous con 100 points for direct evidence or 80 points for in then proceed to C. If no evidence or indirect evidence	ntaminants, as:	sign maximum face. If direct o	ctor subsco	re of
	•		Si	ubscore	
	Rate the migration potential for three potential and ground-water migration. Select the highest re			ation, floo	ding,
	1. Surface-water migration				
	Distance to nearest surface water	3	8	24	24
	Net precipitation	1	6	6	18
	Surface erosion	2	8	16	24
	Surface permeability	1	6	6	18
	Rainfall intensity	1	8	8	24
			Subtotals	60	108
	Subscore (100 x factor score subtotal/maximum sco	re subtotal)			56
	2. Flooding	0	1	0	100
		Subscore	(100 x factor	score/3)	. 0
	3. Ground-water migration				
	Depth to ground water	3	8	24	24
	Net precipitation	1	6	6	18
	Soil permeability	1	8	8	24
	Subsurface flows	0	8	0	24
	Direct access to ground water	N/A	8		
			Subtotals	38	90
	Subscore (100 x factor score subtotal/maximum sco	re subtotal)			42
	Highest pathway subscore				
	Enter the highest subscore value from A, B-1, B-2	, or B-3 above	•		
			Pathways Sub	score	_56
, .	WASTE MANAGEMENT PRACTICES				
•	Average the three subscores for receptors, waste	characteristic	s. and pathwavs		
	•		Receptors Waste Charac Pathways Total 164 di	teristics	28 30 56 * 55
	Apply factor for waste containment from waste man	ag eme nt practi	ces		
	Gross Total Score x Waste Management Practices Fa				

55 x 0.95 =

Page 1 of 2

NAME OF SITE:

No. 3, Waste POL Pond

LOCATION:

BAR-M

DATE OF OPERATION OR OCCURRENCE: --

OWNER/OPERATOR: BAR-M

COMMENTS/DESCRIPTION: Pond is a disposal site for waste POL

SITE RATED BY: G. McIntyre

1. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
8.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
c.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	2	6	12	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	58	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		_28

II. WASTE CHARACTERISTICS

Α. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

Fá	actor Subscore A (from 20 to 100 based on factor score matrix)	80
3.	. Hazard rating (H = high, M = medium, L = low)	Н
2.	. Confidence level (C = confirmed, S = suspected)	С
1.	. Waste quantity (S = small, M = medium, L = large)	M

Apply persistence factor в. Factor Subscore A x Persistence Factor = Subscore B

 $80 \times 1.0 = 80$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

man and a state of the state of

$$80 \times 1.0 = 80$$

 Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
If there is evidence of migration of hazardous con 100 points for direct evidence or 80 points for in then proceed to C. If no evidence or indirect ev	indirect evidenc	ce. If direct en	tor subscor vidence exi	re of ists
		Su	ibscore	80
Rate the migration potential for three potential and ground-water migration. Select the highest re			tion, flood	iing,
1. Surface-water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	1	6	6	18
Surface erosion	2	8	16	24
Surface permeability	1	6	6	18
Rainfall intensity	1	8	8	24
		Subtotals	60	108
Subscore (100 x factor score subtotal/maximum sco	ore subtotal)			56
2. Flooding	0	1	0	100
	Subscore	(100 x factor so	core/3)	0
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	0	8	0	24
Direct access to ground water	N/A	8		
		Subtotals	38	80
Subscore (100 x factor score subtotal/maximum sco	re subtotal)			42
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B-2	', or B-3 above.			
		Pathways Subsc	core	_80
WASTE MANAGEMENT PRACTICES				
Average the three subscores for receptors, waste	characteristics	, and pathwave.		
and the second of the following master		Receptors Waste Characte Pathways Total 188 div	ceristics vided by 3 =	
-			Gre	oss Total S

Gross Total Score x Waste Management Practices Factor = Final Score

Page 1 of

S

Н

50

NAME OF SITE:

No. 4, Current Dump Site

LOCATION:

BAR-M

DATE OF OPERATION OR OCCURRENCE: 1978 to present

OWNER/OPERATOR: BAR-M

COMMENTS/DESCRIPTION: Controlled site receives wastes from site and village

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possibl Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	2	6	12	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	50	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		28

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

- 1. Waste quantity (S = small, M = medium, L = large)
- 2. Confidence level (C = confirmed, S = suspected)
- 3. Hazard rating (H = high, M = medium, L = low)

Factor Subscore A (from 20 to 100 based on factor score matrix)

B. Apply persistence factor Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

50 x 1.0 = 50

III. PATHWAYS

 Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
If there is evidence of migration of hazardous cont 100 points for direct evidence or 80 points for inc then proceed to C. If no evidence or indirect evid	lirect evidend	ce. If direct o	ctor subsco evidence ex	re of ists
		Su	ubscore	
Rate the migration potential for three potential parand ground-water migration. Select the highest rate	thways: sur	face-water migra	stion, floo	ding,
1. Surface-water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	1	6	6	18
Surface erosion	2	8	16	24
Surface permeability	1	6	6	18
Rainfall intensity	1	8	8	24
		Subtotals	60	108
Subscore (100 x factor score subtotal/maximum score	subtotal)	•		56
2. Flooding	0	1	0	100
	Subscore	(100 x factor :	score/3)	0
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	0	8	0	24
Direct access to ground water	N/A	8		
		Subtotals	38	90
Subscore (100 x factor score subtotal/maximum score	subtotal)			42
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B-2,	or B-3 above	•		
		Pathways Sub	score	_56
WASTE MANAGEMENT PRACTICES				
Average the three subscores for receptors, waste cl	naracteristic	s, and pathways		
		Receptors Waste Charact Pathways Total 134 div	teristics vided by 3 :	28 50 56 = 45 oss Total S
Apply factor for waste containment from waste manage	gement practi	ces		
Gross Total Score x Waste Management Practices Fact				

45 x 1.0 =

Page 1 of 2

NAME OF SITE:

No. 8, Contaminated Drainage Cut

LOCATION:

BAR-M

DATE OF OPERATION OR OCCURRENCE: --

OWNER/OPERATOR: BAR-M

COMMENTS/DESCRIPTION: Power house washwater discharged to drainage ditch

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
c.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	2	6	12	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	50	180
	Receptors subscore (100 x factor score subtotal/maxis	mum subtota	1)		28

11. WASTE CHARACTERISTICS

Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large)

М

2. Confidence level (C = confirmed, S = suspected)

С

Hazard rating (H = high, M = medium, L = low)

Н

Factor Subscore A (from 20 to 100 based on factor score matrix)

80

Apply persistence factor

Factor Subscore A x Persistence Factor = Subscore B

$$80 \times 1.0 = 80$$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
100 p	ere is evidence of migration of hazardous contamoints for direct evidence or 80 points for indirect evidence or indirect eviden	ect eviden	ce. If direct (ctor subsco evidence ex	re of ists
			Şı	ubscore	80
	the migration potential for three potential path round-water migration. Select the highest ratio			ation, floo	ding,
1. S	urface-water migration				
D	distance to nearest surface water	3	8	24	24
N	let precipitation	1	6	6	18
S	urface erosion	2	8	16	24
S	surface permeability	1	6	6	18
R	Rainfall intensity	1	8	8	24
			Subtotals	60	108
Subsc	core (100 x factor score subtotal/maximum score s	subtotal)			56
2. F	i ooding	0	1	0	100
		Subscore	(100 × factor	score/3)	0
3. (Ground-water migration				
	Depth to ground water	3	8	24	24
	Wet precipitation	1	6	6	18
5	Sofl permeability	1	8	8	24
9	Subsurface flows	0	8	0	24
ſ	Direct access to ground water	N/A	8		
			Subtotals	38	90
Subsc	core (100 x factor score subtotal/maximum score	subtotal)			56
High	est pathway subscore				
Ente	r the highest subscore value from A, B-1, B-2, o	r 8-3 above	•		
			Pathways Sub	score	80
. WASTI	E MANAGEMENT PRACTICES				
. Aver	age the three subscores for receptors, waste cha	racte r istic	s, and pathways	•	
			Receptors Waste Charac Pathways Total 188 di	vided by 3	28 80 80 = 63 oss Total 5
i. Appi	y factor for waste containment from waste manage	ment practi	ces	u.	

B. Apply factor for waste containment from waste management practices

Gross Total Score x Waste Management Practices Factor = Final Score

63 x 1.0 =

_63

Page 1 of 2

NAME OF SITE:

No. 9, Old Dump Site -- N.W.

LOCATION:

BAR-M

DATE OF OPERATION OR OCCURRENCE: 1970's

OWNER/OPERATOR: BAR-M

COMMENTS/DESCRIPTION: Received mostly scrap metal, suspect hazardous waste

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
Ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	2	6	12	18
١.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	50	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		_28

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1.	Waste quantity (S = small, M = medium, L = large)	M
2.	Confidence level (C = confirmed, S = suspected)	s
3.	Hazard rating ($H = high$, $M = medium$, $L = low$)	н
Fa	ctor Subscore A (from 20 to 100 based on factor score matrix)	50

B. Apply persistence factor Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

$$50 \times 1.0 = 50$$

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
if there is evidence of migration of hazardous 100 points for direct evidence or 80 points for then proceed to C. If no evidence or indirect	indirect eviden	ce. If direct	ctor subsco evidence ex	re of ists
		s	ubscore	
Rate the migration potential for three potentia and ground-water migration. Select the highest			ation, floo	ding,
1. Surface-water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	1	6	6	18
Surface erosion	2	8	16	24
Surface permeability	1	6	6	18
Rainfall intensity	1	8	8	24
		Subtotals	60	108
Subscore (100 x factor score subtotal/maximum s	core subtotal)			56
2. Flooding	0	1	0	100
	Subscore	(100 x factor	score/3)	0
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	2	8	16	24
Direct access to ground water	N/A	8	•-	
		Subtotals	54	90
Subscore (100 x factor score subtotal/maximum s	core subtotal)			60
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B	-2, or B-3 above	•		
		Pathways Sub	score	<u>60</u>
WASTE MANAGEMENT PRACTICES				-2
Average the three subscores for receptors, wast	e characteristic	s, and pathways	•	
		Receptors Waste Charac Pathways Total 138 di	vided by 3 a	28 50 60 • 46 oss Total (
Apply factor for waste containment from waste m	anagement service			

46 x 0.95 =

Gross Total Score x Waste Management Practices Factor = Final Score

Page 1 of 2

NAME OF SITE:

No. 13, Old Dump Site--East

LOCATION:

POW-3

DATE OF OPERATION OR OCCURRENCE: 1956-1971

OWNER/OPERATOR: POW-3

COMMENTS/DESCRIPTION: Received all waste generated at site

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	0	4	0	12
8.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
Ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1 '	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	0	6	0	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	34	180
	Perentore subscare (100 v factor score subtotal/mavi	mum eubtota	11		19

Receptors subscore (100 x factor score subtotal/maximum subtotal)

19

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large)

M

2. Confidence level (C = confirmed, S = suspected)

c

Hazard rating (H = high, M = medium, L = low)

п

Factor Subscore A (from 20 to 100 based on factor score matrix)

50

B. Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

III. PATHWAYS

		Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possibl Score	
A.	100	there is evidence of migration of hazardous cont points for direct evidence or 80 points for ind n proceed to C. If no evidence or indirect evid	direct eviden	ce. If direct	ctor subscore evidence exis	of its	-
				·	ubscore		
В.		e the migration potential for three potential page ground-water migration. Select the highest rai			ation, floodi	ng,	
	1.	Surface-water migration					
		Distance to nearest surface water .	3	8	24	24	
		Net precipitation	1	6	6	18	
		Surface erosion	1	8	8	24	
		Surface permeability	1	6	6	18	
		Rainfall intensity	1	8	8	24	
				Subtotals	52	108	
	Sub	score (100 x factor score subtotal/maximum score	subtotal)			48	
	2.	Flooding	0	1	0	100	
			Subscore	(100 x factor	score/3)	0	
	3.	Ground-water migration					
		Depth to ground water	3	8	24	24	
		Net precipitation	1	6	6	18	
		Soil permeability	1	8	8	24	
		Subsurface flows	0	8	0	24	
		Direct access to ground water	N/A	8			
				Subtotals	38	90	
	Sub	score (100 x factor score subtotal/maximum score	e subtotal)			42	
c.	Hig	hest pathway subscore					
	Ent	er the highest subscore value from A, B-1, B-2,	or B-3 above	•			
		•		Pathways Sub	score	48	
ıv.	WAS	TE MANAGEMENT PRACTICES				_	
۸.		prage the three subscores for receptors, waste cl	haracteristic	s. and pathwavs	•		
				Receptors Waste Charac Pathways Total 117 di	teristics vided by 3 =	19 50 48 39 s Total	Scon
8.	Арр	ly factor for waste containment from waste manag	gement practi	ces			
	Gra	oss Total Score x Waste Management Practices Fact	tor = Final S	core			

39 x 1.0 =

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50

NAME OF SITE:

No. 16, Old Dump Site--N.W.

LOCATION:

POW-2

DATE OF OPERATION OR OCCURRENCE: 1956 to 1978

OWNER/OPERATOR: POW-2

COMMENTS/DESCRIPTION: Received all waste generated at the site

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
٥.	Distance to reservation boundary	3	6	18	18
E .	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtota i s	44	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		24

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1.	Waste quantity (S = small, M = medium, L = large)	M
2.	Confidence level (C = confirmed, S = suspected)	S
3.	Hazard rating (H = high, M = medium, L = 1 ow)	Н

B. Apply persistence factor Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

Factor Subscore A (from 20 to 100 based on factor score matrix)

						Page 2
 A.	Rating Fact	tor	Fac Rat	i a a	Factor	Maximo
۸.	100 points for diagram	gration of hazardow		Multiplier	Score	Possib Score
_	If there is evidence of mig 100 points for direct evide then proceed to C. If no e			ses, proceed to 8		ITACS
8.	Rate the migration potentia and ground-water migration. 1. Surface-water migration	l for three potenti	al pathways:	Surfaceameter	Subscore	
	•		c rating, and	proceed to C.	ration, floo	ding,
	Distance to nearest surf	ace water				
	Net precipitation		3	8	24	24
	Surface erosion		1	6	6	
	Surface permeability		1	8	8	18
	Rainfall intensity		1	6	6	24
	 		1	8	8	18
	Subscore (100 x factor score : 2. Flooding	euba-a 3 c		Subtotals	52	24
:	2. Flooding	scurotal/maximum sc	ore subtotal)		32	108
			30	1	30	48
3	- Ground-water migration		Subscor	e (100 x factor s	30	100
	Depth to ground water			3,000,000	core/3)	30
	Net precipitation		3	8		
	Soil permeability		1	6	24	24
	Subsurface flows		1	8	6	18
			O	8	8	24
	Direct access to ground wat	er	N/A	8	0	24
Sui	Score (100			Subtotals		
Hic	bscore (100 x factor score sub Thest pathway subscore	total/maximum score	subtotall	Soncorais	38	90
	3 4403001.6					42
	er the highest subscore value	from A, B-1, B-2,	or 8-3 above.			
WAST	TE MANAGEMENT PRACTICES			Pathways Subscor	•	48
Aver	age the three subscores for r	eceptors was			•	
	age the three subscores for r	· ······ neste cha	racteristics,	and pathways.		
АррТу	factor for weets			Receptors Waste Characteris Pathways Total 122 divided	by 3 =	24 50 18
Gross	factor for waste containment	from waste managem	ent practices		Gross Tot	al Score
	Total Score x Waste Manageme	nt Practices Factor	Final Score	•		
			•	1 x 0.95 =	_ 3	•

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60

NAME OF SITE:

No. 28, POL Storage Area

LOCATION:

POW-1

DATE OF OPERATION OR OCCURRENCE: Current

OWNER/OPERATOR: POW-1

COMMENTS/DESCRIPTION: Evidence of surface-water contamination

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
Ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	44	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		24

11. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

- Waste quantity (S = small, M = medium, L = large)
 Confidence level (C = confirmed, S = suspected)
- 3. Hazard rating (H = high, M = medium, L = low)

Factor Subscore A (from 20 to 100 based on factor score matrix)

B. Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $60 \times 0.8 = 48$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

$$60 \times 1.0 = 48$$

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
If there is evidence of migration of hazardous con 100 points for direct evidence or 80 points for in then proceed to C. If no evidence or indirect evi	direct eviden	ce. If direct a	ctor subsco evidence ex	re of
		Si	ubscore	80
Rate the migration potential for three potential p and ground-water migration. Select the highest ra	athways: sur	face-water migra	stion, floo	ding,
1. Surface-water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	1	6	6	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	1	8	8	24
		Subtotals	52	108
Subscore (100 x factor score subtotal/maximum scor	e subtotal)			48
2. Flooding	0	1	0	100
	Subscore	(100 x factor :	score/3)	0
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	0	8	0	24
Direct access to ground water	N/A	8		
		Subtotals	38	90
Subscore (100 x factor score subtotal/maximum scor	e subtotal)			42
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B-2,	or B-3 above	•		
		Pathways Subs	score	80
WASTE MANAGEMENT PRACTICES				
Average the three subscores for receptors, waste o	haracteristic	s, and pathways.		
		Receptors Waste Charact Pathways Total 152 div	vided by 3 :	24 48 80 = 51 oss Total S
Apply factor for waste containment from waste mana	gement practi	ces	Jr.	

Gross Total Score x Waste Management Practices Factor = Final Score

Page 1 of 2

NAME OF SITE:

No. 29, Diesel Fuel Spill

LOCATION:

POW-1

DATE OF OPERATION OR OCCURRENCE: 1978

OWNER/OPERATOR: PGW-1

COMMENTS/DESCRIPTION: 25,000-Gallon Diesel Fuel Spill

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
٥.	Distance to reservation boundary	3	6	18	18
E.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	44	180
	Receptors subscore (100 x factor score subtotal/maxis	mum subtota	1)		24

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

- 1. Waste quantity (S = small, M = medium, L = large)
- 2. Confidence level (C = confirmed, S = suspected)
- 3. Hazard rating (H = high, M = medium, L = low)

H ·

Factor Subscore A (from 20 to 100 based on factor score matrix)

100

L

B. Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $100 \times 0.8 = 80$

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

III. PATHWAYS

	Rating Factor	Factor Rating (0-3)	Multipiler	Factor Score	Maximum Possibl Score				
100 pc	ere is evidence of migration of hazardo pints for direct evidence or 80 points proceed to C. If no evidence or indire	for indirect evidenc	ce. If direct of	ctor subsco evidence ex	re of ists				
			Se	ubscore					
	Rate the migration potential for three potential pathways: surface-water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.								
1. Se	urface-water migration								
D	stance to nearest surface water	3	8	35	24				
N	at precipitation	1	6	6	18				
Si	ur ce erosion	1	8	8	24				
St	urface permeability	1	6	6	18				
R	ainfall intensity	1	8	8	24				
			Subtotals	52	108				
Subsc	Subscore (100 x factor score subtotal/maximum score subtotal)								
2. F	looding	0	1	0	100				
	Subscore (100 x factor score/3) 0								
3. G	round-water migration								
D	epth to ground water	3	8	24	24				
N	et precipitation	1	6	6	18				
S	oil permeability	1	8	8	24				
S	ubsurface flows	0	8	0	24				
D	frect access to ground water	N/A	8						
			Subtotals	38	90				
Subsc	ore (100 x factor score subtotal/maximu	m score subtotal)			42				
Hi ghe	st pathway subscore								
Enter	the highest subscore value from A , $B-1$, B-2, or B-3 above	•						
			Pathways Sub	score	48				
WASTE	MANAGEMENT PRACTICES								
Avera	Average the three subscores for receptors, waste characteristics, and pathways.								
			Pathways	Waste Characteristics					
Annly	factor for waste containment from wast	e management practi	***	-					

51 x 1.0 =

Gross Total Score x Waste Management Practices Factor = Final Score

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NAME OF SITE:

No. 31, 01d Dump Lagoon Site

LOCATION:

POW-1

DATE OF OPERATION OR OCCURRENCE: 1955 to 1972

OWNER/OPERATOR: POW-1

COMMENTS/DESCRIPTION: Received all wastes generated at site

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	<u>Multiplier</u>	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
8.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
Ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1 ·	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	44	180
	Receptors subscore (100 x factor score subtotal/maxis	num subtota	1)		24

II. WASTE CHARACTERISTICS

Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large)

M

2. Confidence level (C = confirmed, S = suspected)

3. Hazard rating (H = high, M = medium, L = low)

Н

Factor Subscore A (from 20 to 100 based on factor score matrix)

50

Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

_	Rating Factor	Factor Rating (0-3)	Mult plier	Factor Score	Maximum Possible Score
	If there is evidence of migration of hazardous con 100 points for direct evidence or 80 points for in them proceed to C. If no evidence or indirect ev	ndirect eviden	ce. If direct (ctor subsco evidence ex	re of ists
			Sı	ubscore	
	Rate the migration potential for three potential and ground-water migration. Select the highest re			ation, floo	ding,
	1. Surface-water migration				
	Distance to nearest surface water	3	8	24	24
	Net precipitation	1	6	6	18
	Surface erosion	1	8	8	24
	Surface permeability	1	6	6	18
	Rainfall intensity	1	8	8	24
			Subtotals	52	108
	Subscore (100 x factor score subtotal/maximum sco	re subtotal)			48
	2. Flooding	0	1	0	100
		Subscore	(100 x factor	score/3)	G
	3. Ground-water migration				
	Depth to ground water	3	8	24	24
	Net precipitation	1	6	6	18
	Soil permeability	1	8	8	24
	Subsurface flows	0	3	0	24
	Direct access to ground water	N/A	8		
			Subtotals	38	90
	Subscore (100 x factor score subtotal/maximum sco	re subtotal)			42
	Highest pathway subscore				
	Enter the highest subscore value from A, B-1, B-2	, or B-3 above	•		
			Pathways Sub	score	<u>48</u>
	WASTE MANAGEMENT PRACTICES				
	Average the three subscores for receptors, waste	characteristic	s, and pathwavs.		
	• • • • • • • • • • • • • • • • • • •		Receptors Waste Charact Pathways Total 122 div	teristics vided by 3 :	
				Gre	oss Total S

Gross Total Score x Waste Management Practices Factor = Final Score

Page 1 of 2

NAME OF SITE:

No. 32, Husky Dump Site

LOCATION:

POW-1

DATE OF OPERATION OR OCCURRENCE: 1972-present

OWNER/OPERATOR: POW-1

COMMENTS/DESCRIPTION: Receives all wastes generated at site and at Husky Oil Co.

SITE RATED BY: G. Mcintyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3 .	6	18	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	44	180
	Receptors subscore (100 x factor score subtotal/maxis	mum subtota	1)		24

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1.	. Waste quantity (S = small, M = medium, L = large)	M
2.	. Confidence level (C = confirmed, S = suspected)	S
3.	. Hazard rating (H = high, M = medium, L = low)	н
Fa	actor Subscore A (from 20 to 100 based on factor score matrix)	50

B. Apply persistence factor
Factor Subscore A × Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
If there is evidence of migration of hazardous con 100 points for direct evidence or 80 points for in then proceed to C. If no evidence or indirect evi	direct eviden	ce. If direct (ctor subsco evidence ex	re of ists
		Su	ubscore	
Rate the migration potential for three potential p and ground-water migration. Select the highest ra			ation, floo	ding,
1. Surface-water migration				
Distance to nearest surface water	3	8 .	24	24
Net precipitation	1	6	6	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	1	8	8	24
		Subtotals	52	108
Subscore (100 x factor score subtotal/maximum score	e subtotal)			48
2. Flooding	0	1	0	100
	Subscore	(100 x factor s	score/3)	0
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	0	8	0	24
Direct access to ground water	N/A	8		
		Subtotals	38	90
Subscore (100 x factor score subtotal/maximum scor	e subtotal)			42
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B-2,	or B-3 above	•		
		Pathways Subs	score	48
WASTE MANAGEMENT PRACTICES				
Average the three subscores for receptors, waste c	haracteristic:	s, and pathways.	,	
		Receptors Waste Charact Pathways Total 122 div	eristics	24 50 48 • 41 oss Total S
Apply factor for waste containment from waste mana	nement opposit	~~*	JI.	
Gross Total Score x Waste Management Practices Fac				

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100

NAME OF SITE:

No. 37, Diesel Fuel Spills

LOCATION:

LIZ-3

DATE OF OPERATION OR OCCURRENCE: Early 1970's and 1976

OWNER/OPERATOR: LIZ-3

COMMENTS/DESCRIPTION: Two 10,000-gallon diesel fuel spills under the power house

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	1	4	4	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	2	6	12	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	38	180
	Receptors subscore (100 x factor score subtotal/maxin	mum subtota	1)		21

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1.	Waste quantity (S = small, M = medium, L = large)	L
2.	Confidence level (C = confirmed, S = suspected)	С
3.	Hazard rating (H = high, M = medium, L \neq low)	н

Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

Factor Subscore A (from 20 to 100 based on factor score matrix)

100 × 0.8 = 80

C. Apply physical state multiplier

Subscore B x Physical State Multiplier = Waste Characteristics Subscore

 $80 \times 1.0 = 80$

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
	If there is evidence of migration of hazardous of 100 points for direct evidence or 80 points for then proceed to C. If no evidence or indirect of	indirect eviden	ce. If direct of		
			Se	ubscore	
	Rate the migration potential for three potentia and ground-water migration. Select the highest			ation, floo	ding,
	1. Surface-water migration				
	Distance to nearest surface water	2	8	16	24
	Net precipitation	1	6	6	18
	Surface erosion	1	8	8	24
	Surface permeability	1	6	6	18
	Rainfall intensity	1	8	8	24
			Subtotals	44	108
	Subscore (100 x factor score subtotal/maximum s	core subtotal)			41
	2. Flooding	0	1	0	100
		Subscore	(100 x factor	score/3)	o
	3. Ground-water migration				
	Depth to ground water	3	8	24	24
	Net precipitation	1	6	6	18
	Soil permeability	1	8	8	24
	Subsurface flows	o	8	0	24
	Direct access to ground water	N/A	8		
			Subtotals	38	90
	Subscore (100 x factor score subtotal/maximum s	core subtotal)	•		42
	Highest pathway subscore				
	Enter the highest subscore value from A, B-1, B	-2, or B-3 above	•		
			Pathways Sub	score	42
•	WASTE MANAGEMENT PRACTICES				
	Average the three subscores for receptors, wast	e characteristic	s, and pathways	•	
			Receptors Waste Charac Pathways Total 143 di	vided by 3	21 80 42 = 48 oss Total S

B. Apply factor for waste containment from waste management practices
Gross Total Score x Waste Management Practices Factor = Final Score

48 x 1.0 =

<u>48</u>

М

50

NAME OF SITE:

No. 38, Current Dump Site

LOCATION:

LIZ-3

DATE OF OPERATION OR OCCURRENCE: 1974 to present

OWNER/OPERATOR: LIZ-3

COMMENTS/DESCRIPTION: Receives all wastes from site, well maintained dump site

SITE RATED BY: G. McIntyre

1. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	0	4	0	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	2	6	12	18
E.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	34	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		19

II. WASTE CHARACTERISTICS

в.

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

- Waste quantity (S = small, M = medium, L = large)
- 2. Confidence level (C = confirmed, S = suspected) S
- 3. Hazard rating (H = high, M = medium, L = low)

Factor Subscore A (from 20 to 100 based on factor score matrix)

Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
If there is evidence of migration of hazardous 100 points for direct evidence or 80 points for then proceed to C. If no evidence or indirect	contaminants, as: indirect eviden	sign maximum fa ce. If direct	ctor subsco	re of
		s	ubscore	
Rate the migration potential for three potentia and ground-water migration. Select the highest	l pathways: sur rating, and pro	face-water migr ceed to C.	ation, floo	ding,
1. Surface-water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	1	6	8	18
Surface erosion	1	8	6	24
Surface permeability	1	6	8	18
Rainfall intensity	1	8	6	24
		Subtotals	52	108
Subscore (100 x factor score subtotal/maximum s	core subtotal)			48
2. Flooding	0	1	0	100
	Subscore	(100 x factor	score/3)	0
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	0	8	8	24
Direct access to ground water	N/A	8		
		Subtotals	38	90
Subscore (100 x factor score subtotal/maximum s	core subtotal)			42
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B	3-2, or B-3 above			
		Pathways Sub	score	48
. WASTE MANAGEMENT PRACTICES				
Average the three subscores for receptors, wast	e characteristic	s, and pathways	•	
		Receptors Waste Charac Pathways Total 117 di	vided by 3	19 50 48 = 39 oss Total S
Apply factor for waste containment from waste m	management practi	ces		

Gross Total Score x Waste Management Practices Factor = Final Score

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NAME OF SITE:

No. 39, Old Dump Sfte--South

LOCATION:

LIZ-3

DATE OF OPERATION OR OCCURRENCE: 1956 to 1974

OWNER/OPERATOR: L12-3

COMMENTS/DESCRIPTION: Received all wastes from site

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	0	4	0	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	Ò	6	0	18
			Subtotals	40	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		_22

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1.	Waste quantity (S $=$ small, M $=$ medium, L $=$ large)	М
2.	Confidence level (C = confirmed, S = suspected)	S
3.	Hazard rating (H = high, M = medium, L = low)	Н
Fac	ctor Subscore A (from 20 to 100 based on factor score matrix)	50

B. Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

$$50 \times 1.0 = 50$$

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
١.	If there is evidence of migration of hazardous co 100 points for direct evidence or 80 points for i then proceed to C. If no evidence or indirect ev	ndirect eviden	ce. If direct e		
			Su	ibscore	
в.	Rate the migration potential for three potential and ground-water migration. Select the highest ${\bf r}$	pathways: sur ating, and pro	face-water migra ceed to C.	ition, floor	iing,
	1. Surface-water migration				
	Distance to nearest surface water	3	8	24	24
	Net precipitation	1	6	6	18
	Surface erosion	1	8	8	24
	Surface permeability	1	6	6	18
	Rainfall intensity	1	8	8	24
			Subtotals	52	108
	Subscore (100 \times factor score subtotal/maximum sco	re subtotal)			48
	2. Flooding	0	1	0	100
		Subscore	(100 x factor s	core/3)	0
	3. Ground-water migration				
	Depth to ground water	3	8	24	24
	Net precipitation	1	6	6	18
	Soil permeability	1	8	8	24
	Subsurface flows	0	8	O	24
	Direct access to ground water	N/A	8		
			Subtotals	38	90
	Subscore (100 x factor score subtotal/maximum sco	re subtotal)			42
С.	Highest pathway subscore				
	Enter the highest subscore value from A, B-1, B-2	, or B-3 above	•		
			Pathways Subs	score	48
۱۷.	WASTE MANAGEMENT PRACTICES				
۸.	Average the three subscores for receptors, waste	characteristic:	s, and pathways.		
			Receptors Waste Charact Pathways Total 120 div	rided by 3 =	22 50 48 40 ss Total Sco
в.	Apply factor for waste containment from waste man.	agement practio	005	3.0	

Gross Total Score x Waste Management Practices Factor x Final Score

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NAME OF SITE:

No. 40, Current Dump Site

LOCATION:

LIZ-2

DATE OF OPERATION OR OCCURRENCE: 1978 to present

OWNER/OPERATOR: LIZ-2

COMMENTS/DESCRIPTION: Receives all wastes from site and nearby village

SITE RATED BY: G. Mcintyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	0	4	0	12
в.	Distance to nearest well	Q	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
Ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	. Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
١.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	40	180
	Receptors subscore (100 x factor score subtotal/maxi	mum subtota	1)		22

Receptors subscore (100 x factor score subtotal/maximum subtotal)

22

М

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

B. Apply persistence factor Factor Subscore A x Persistence Factor = Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

	Pating Factor	Factor Rating (0-3)	Multinlian	Factor Score	Maximum Possible Score
	Rating Factor If there is evidence of migration of hazardous of 100 points for direct evidence or 80 points for	ontaminants, as: indirect evidence	ce. if direct e	tor subsco	re of
	then proceed to C. If no evidence or indirect e	vidence exists,		ıbscore	
	Rate the migration potential for three potential	pathways: sur			dina.
	and ground-water migration. Select the highest				-··· 3 ,
	1. Surface-water migration				
	Distance to nearest surface water	3	8	24	24
	Net precipitation	1	6	6	18
	Surface erosion	1	8	8	24
	Surface permeability	1	6	6	18
	Rainfall intensity	1	8	8	24
			Subtotals	52	108
	Subscore (100 x factor score subtotal/maximum sc	core subtotal)			48
	2. Flooding	30	1	30	100
		Subscore	(100 x factor s	score/3)	30
	3. Ground-water migration				
	Depth to ground water	3	8	24	24
	Net precipitation	1.	6	6	18
	Soil permeability	1	8	8	24
	Subsurface flows	1	8	8	24
	Direct access to ground water	N/A	8		
			Subtotals	46	90
	Subscore (100 x factor score subtotal/maximum so	core subtotal)			51
	Highest pathway subscore				
	Enter the highest subscore value from A, B-1, B-	-2, or B-3 above	•		
			Pathways Sub	score	51
٧.	WASTE MANAGEMENT PRACTICES				
•	Average the three subscores for receptors, waste	e characteristic	s, and pathways	•	
			Receptors Waste Charac Pathways Total 123 div	vided by 3	
3.	Apply factor for waste containment from waste ma	anagement practi	ces	Gr	oss Total S

Gross Total Score x Waste Management Practices Factor = Final Score

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NAME OF SITE:

No. 43, Old Dump Site

LOCATION:

LIZ-2

DATE OF OPERATION OR OCCURRENCE: 1956 to 1978

OWNER/OPERATOR: LIZ-2

COMMENTS/DESCRIPTION: Received all wastes from site

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	2	4	8	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	. 18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	O	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	48	180
	Receptors subscore (100 x factor score subtotal/maxis	mum subtota	1)		27

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large)

A Commission of the Commission

M

2. Confidence level (C = confirmed, S = suspected)

S

3. Hazard rating (H = high, M = medium, L = low)

__

H .

Factor Subscore A (from 20 to 100 based on factor score matrix)

50

B. Apply persistence factor
Factor Subscore A x Persistence Factor ≈ Subscore B

 $50 \times 1.0 = 50$

C. Apply physical state multiplier

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
	If there is evidence of migration of hazardous of 100 points for direct evidence or 80 points for then proceed to C. If no evidence or indirect e	contaminants, as: indirect evidence	sign maximum face. If direct	ctor subsco	re of
			S	ubscore	
•	Rate the migration potential for three potential and ground-water migration. Select the highest			ation, floo	ding,
	1. Surface-water migration				
	Distance to nearest surface water	3	8	24	24
	Net precipitation	1	6	6	18
	Surface erosion	1	8	8	24
	Surface permeability	1	6	6	18
	Rainfall intensity	1	8	8	24
			Subtotals	52	108
	Subscore (100 x factor score subtotal/maximum sc	core subtotal)			48
	.2. Flooding	30	1	30	100
		Subscore	(100 × factor	score/3)	30
	3. Ground-water migration				
	Depth to ground water	3	8	24	24
	Net precipitation	1	6	6	18
	Soil permeability	1	8	8	24
	Subsurface flows	1	8	8	24
	Direct access to ground water	N/A	8		
			Subtotals	46	90
	Subscore (100 x factor score subtotal/maximum so	core subtotal)			51
•	Highest pathway subscore				
	Enter the highest subscore value from A, B-1, B	-2, or B-3 above	•		
			Pathways Sub	score	_51
٧.	WASTE MANAGEMENT PRACTICES				
	Average the three subscores for receptors, waste	e characteristic	s, and pathways	•	
			Receptors Waste Charac Pathways Total 128 di	teristics	27 50 51 = 43 oss Total S
3.	Apply factor for waste containment from waste m	anagement practi	ces		
	Cross Total Score x Waste Management Practices	Factor = Final S	core		

H - 34

43 x 0.95 =

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NAME OF SITE:

No. 44, Suspected Dump Site

LOCATION:

LIZ-2

DATE OF OPERATION OR OCCURRENCE: 1956 to 1980

OWNER/OPERATOR: LIZ-2

COMMENTS/DESCRIPTION: Used primarily by villagers

SITE RATED BY: G. McIntyre

I. RECEPTORS

	Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Α.	Population within 1,000 feet of site	2	4	8	12
в.	Distance to nearest well	0	10	0	30
c.	Land use/zoning within 1 mile radius	0	3	0	9
D.	Distance to reservation boundary	3	6	18	18
ε.	Critical environments within 1 mile radius of site	1	10	10	30
F.	Water quality of nearest surface-water body	1	6	6	18
G.	Ground-water use of uppermost aquifer	0	9	0	27
н.	Population served by surface-water supply within 3 miles downstream of site	1	6	6	18
1.	Population served by ground-water supply within 3 miles of site	0	6	0	18
			Subtotals	48	180
	Receptors subscore (100 x factor score subtotal/maxis	mum subtota	1)		27

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1.	. Waste quantity (5 " Small, M " medium, L " large)	
2.	. Confidence level (C = confirmed, S = suspected)	S
3.	. Hazard rating (H = high, M = medium, L = low)	н
Fa	actor Subscore A (from 20 to 100 based on factor score matrix)	50

B. Apply persistence factor
Factor Subscore A x Persistence Factor = Subscore B

$$50 \times 1.0 = 50$$

C. Apply physical state multiplier

 Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
If there is evidence of migration of hazardous con 100 points for direct evidence or 80 points for in then proceed to C. If no evidence or indirect evi	direct ev ide nd	ce. If direct (
		Se	ubscore	
Rate the migration potential for three potential p and ground-water migration. Select the highest ra			stion, floo	ding,
1. Surface-water migration				
Distance to nearest surface water	3	8	24	24
Net precipitation	1	6	6	18
Surface erosion	1	8	8	24
Surface permeability	1	6 .	6	18
Rainfall intensity	1	8	8	24
		Subtotals	52	108
Subscore (100 x factor score subtotal/maximum scor	e subtotal)			48
2. Flooding	30	1	30	100
	Subscore	(100 x factor	score/3)	30
3. Ground-water migration				
Depth to ground water	3	8	24	24
Net precipitation	1	6	6	18
Soil permeability	1	8	8	24
Subsurface flows	1	8	8	24
Direct access to ground water	N/A	8		
		Subtotals	46	90
Subscore (100 x factor score subtotal/maximum scor	e subtotal)			51
Highest pathway subscore				
Enter the highest subscore value from A, B-1, B-2,	or B-3 above	•		
		Pathways Sub	score	_51
WASTE MANAGEMENT PRACTICES				
Average the three subscores for receptors, waste c	haracteristic	s, and pathways	•	
. ,		Receptors Waste Charac Pathways Total 128 di	teristics	27 50 51 = 43 oss Total 3
Apply factor for waste containment from waste mana	cement savet		3.	

43 x 0.95 =
